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*THE CATHOLIC VIEW OF PUBLIC EDUCATION IN THE
UNITED STATES.*

IT would be wholly superfluous to address an argument to any portion of the American people upon the absolute necessity of popular education. Upon that point there is no diversity of opinion. The fundamental principles of our social system rest upon it as a corner-stone; such as, that government derives all of its authority, under God, from the consent of the governed; the people possess the sovereignty; public officers are only public servants; the multitude rules by representation; Congress, the President, and the Courts are the people—without the people they have no existence; constitutions and laws are but the well-ordered expression of the public will, at all times revocable, in an orderly manner, and binding upon each citizen as the will of all, unless the popular decree be against the law of God, when, of course, it binds no man's conscience. Hereditary rights, class privileges, ancient social divisions, and distributions of power, have all disappeared, or rather, have never existed here. Even in Colonial times, the Crown was almost a myth, and cast but a shadowy reflection into the deep waters of the Hudson and the Mississippi, as they rolled on to the sea from the illimitable forests where the moccasined hunter was then as free as the red Indian had been for unrecorded centuries. The Revolution of '76 changed the government, but really left the cardinal points of our American civilization very much as it found them. In fact, our political education is traceable back to the days of Alfred and Edward the Confessor; for the Norman king gave us no concession in Magna Charta which was unknown to Saxon liberty. In our Republic we have only drawn out these principles to their extreme conclusions. We have gone back to

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the original hypothesis, that society is an association of equal rights for mutual protection; and that power, under God, belongs to the whole body of corporators—i. e., the multitude. From this postulate we are obliged to pass immediately to the axiom that there can be no fit administration of power without knowledge. Knowledge may be acquired in several ways. The most direct and impressive is experience. Alcuin was master of books; but Charlemagne was master of men. The great emperor could not read, but he possessed the wisdom to govern. Who shall say that he was not "educated" in the highest sense of that vague term? And yet, it is very clear that knowledge gained only by the slow accretions of experience will not answer the wants and rapid movements of such a Republic as ours, in the age of steam and electricity. Each generation must be trained from the cradle, and made to possess, enlarge, and transmit to its successor all the accumulated knowledge of its predecessor. As no atom of matter perishes, but is forever re-combining and re-producing; so every true idea and sound moral sentiment must be made the inheritance of society, and never cease to exert its power for good among men. Not that moral truth can ever change; for, it is now precisely what it has been from all eternity; nor is it better understood by the divine to-day, than it was by Moses when he came down from the mountain; but the multitude may be made more fully to comprehend and reverence it. Christianity, although specially revealed and miraculously propagated, did not suddenly conquer and civilize barbarous peoples. It has been eighteen hundred years struggling with the powers of darkness and the corruption of the human heart; and yet, alas! how very, very far removed are not even the most polished nations from the severe standard of Christian perfection! See the tyrannies, the oppressions, the cruelties, the wars, the pride, the luxury, the folly and deceit, which fill the fairest parts of the earth with mourning, and drag mankind down into the slough of sin and sorrow! To be sure, there is a certain stereotyped class of saints and philosophers who cry aloud, "Compare our enlightened era with the rude times of the crusaders; or place the nineteenth along side of the ninth century; and let the celestial light of our civilization shine down into the abysses of monkish superstition!" We shall, nevertheless, refuse to close our eyes to those stupendous sins which have supplanted the violent crimes of our ancestors. We shall see how their robber-sword has been put aside for our forger's pen; how their wild foray has given place to our gigantic stock speculation or bank swindle, which sweeps widows and orphans, by the ten thousand, into utter poverty and despair; how their fierce lust has been civilized into the decorous forms of the divorce courts; how their bold grasping of power has been changed into the arts of the whining demagogue; how their undisguised plunder of the public treasure in times of

civil commotion, has been superseded by the adroit peculation and covert bribery of our times of peace; how their courageous, rude anger has vanished before the safer and more efficacious process of concealed hatred, nestling, like the scorpion, among the roses of adulation. We certainly shall be obliged to remember these things, to the great reproach of our times, and in serious dread of the future; and we shall feel anxious to go to work to find the cause and the remedy. We are all agreed that education, that is, knowledge and moral training, cannot be dispensed with for an hour—that no nation can be governed safely, much less govern itself at all, without a clear head and a sound heart—that, if governed as a dumb brute, it will kick against the pricks, fly in the face of its hard master, and dash out its foolish brains against the stone wall! It will sing the "*Marseillais*" and cover its garments with the blood of kings and aristocrats; until, having spent its fury, it will return to its crust and shout "*Vive l'Empereur!*" Should it attempt to govern itself, it will become the prey of the infamous men who are the spawn of its own passions. Without knowledge, the nation is either a silent sepulchre, where all hopes are buried, or a raging sea, where they are quickly wrecked. Knowledge, then, *it must have*. But, *what* knowledge? Shall we say, knowledge of the Arts? Ask Phidias and Praxiteles if the Arts saved Greece! Shall we say, polite literature? Ah, let the mournful Chorus of Sophocles, Æschylus, and Euripides give utterance to the sad cries of those old pagan hearts for a higher virtue than the sublimest tragedy could teach them! Shall it be the eloquence of the orator? or the wisdom of the legislator? We shall hear in the Philippics how vainly the master of orators appealed to a degenerate race, and we shall read in the closing annals of Athens and Sparta how utterly the wisdom of Solon and Lycurgus had failed to save polished and warlike States from the penalty which God has affixed to the crimes of nations. Shall we take refuge in human philosophy? Socrates and the divine Plato had cast off the degrading superstitions of paganism, and had proclaimed to their intellectual countrymen the Eternity and Unity of God and the immortality of the soul of man. They had most earnestly enjoined upon them the sanctity of all the natural virtues—temperance, industry, patience, courage, honesty, benevolence, patriotism, continence, filial duty, conjugal fidelity; but, what did their philosophy avail? Why did it not save the Grecian States? They went down into the night upon which no sun ever again shone! Their Roman conquerors seized upon the rich treasures of their knowledge. The Senate listened with rapture to the wisdom of the old Hellenic sages translated by Cicero into the noble Latin tongue. Virgil and Livy sought to inspire the Roman heart with grand ideas borrowed from the Greek masters. What did it all avail? The Roman Republic had practised the natural

virtues as fully as unregenerated man is capable of doing, by the power of vigorous and cultivated reason. What did it avail? They, too, went down into the tomb of dead nations; and a few broken columns remain to mark the seat of their world-wide empire! It is very manifest, then, that intellectual culture, even when carried to the highest development of which men are capable, can never subdue their passions, nor enable them to uphold the civilization to which they may have attained in the freshness of their national life. If this were not so, then we could not clearly perceive the necessity of the Christian revelation. If man was self-sustaining, he would not require the arm of God to lean upon. The apothegm of the Greek sage, "*Know thyself*," was a dead-letter. It was precisely to teach man how to know himself, that our Saviour came. And this is the whole knowledge! No poetry, oratory, history, philosophy, arts, or sciences, could teach that; else, the world would have learned it four thousand years ago, and the primitive races would not have perished. Even under the Christian dispensation, and in very modern times, men and nations have failed to know themselves, because they turned their backs on Christ and placed their hopes in human science and natural virtue. And so, we have seen an enlightened nation, in our day, deify humanity, refuse to adore God, and prostrate itself before a harlot, as the high-priestess in the apotheosis of Reason! We have seen an anti-christian conspiracy, formed of the most learned, eloquent, witty, and fascinating men of modern Europe, exerting the highest arts of genius to re-paganize the world. We have seen science, rudely torn from religion, waging an insane war against the peace of society. That terrific phase of blasphemous infidelity has passed from our immediate view; but, has it left nothing more dangerous behind? We think it has. The mass of mankind shrank with horror from the defiant blasphemy of Voltaire; and they recoiled with alarm from the ruin caused by his teachings. We love liberty; but we dread license, anarchy, chaos. Man is, also, naturally religious. Long after he had forgotten the traditions of the Patriarchs and had lost God in the night of heathen idolatry, he still clung to

"The instinct of old reverence!"

and his wretched soul yearned after its Creator.

The false worship of Greece and Rome was the inarticulate cry of a lost people for that true worship which was promised to the Gentile at the appointed time. False and hideous as it was, who will not say that it was far preferable to atheism? It was only when the Epicurean philosophy had destroyed the faith of those people, that they cast off all moral restraint, and were swept away in the torrent of their vices. Man is naturally religious; and therefore the world will not long patiently

tolerate the presence of blatant infidelity. *The danger is not there.* He who goes about like a roaring lion seeking whom he may devour, knows very well that mankind is more easily seduced under the forms of virtue than by gross sin. His incarnate agents on earth know this too. Hence we find all the world covered over with gossamer nets of seduction ! The press teems with books and journals, not confessedly infidel, yet working in the interests of infidelity ; fanning the passions and exciting the morbid sensibilities of youth ; teaching religious indifference under the pleasing garb of liberality ; holding up the discipline of the Church as hostile to personal freedom ; depicting the doctrines and ceremonies of the Christian religion as trammels upon mental activity and intellectual progress ; arraying the laity against their pastors ; insisting that, to be a humane man, an honest and industrious worker, a faithful friend, a good husband and father, a patriotic citizen, is to be all and to do all that the highest Christian morality can require or the welfare of the human race demand ; asserting that the specific dogmas of the Christian faith, with perhaps one or two exceptions, are not essential, and may be rejected without concern ; receiving with indifference and polite complacency either the divinity or the humanity of Christ ; and accepting Him as a God-Saviour, a man-prophet, or a harmless, self-deluded impostor, as your fancy may please to dictate ; in a word, deifying man, and making this world, with its wealth, its pleasures, its pride and pomp, its power and magnificence, its civilization and nationalities, the sole object of his anxiety and love. Such, we say, is the growing evil of this nineteenth century, which is so scornful of the "dark ages ;" an evil infinitely more subtle and destructive than the rage or gibes of Voltaire. This poison has gone through the chilled blood of renegade old men, destroying the religious vitality which had sustained their faith from the baptismal font to the very edge of the grave ; how must it not, therefore, affect the hot veins of inexperienced youth, whose generous impulses are their greatest peril ! See how, in those European revolutions gotten up by avowed enemies of religion, the students of the Universities flock to the standards of infidelity, with the seductive cry of "*Liberty, Equality, Fraternity!*" They enlist, with enthusiasm, under what they believe to be the consecrated banner of inalienable human rights—their young sympathetic hearts are justly moved by the sufferings of the toiling millions, caused by unequal laws—their sense of justice and human brotherhood is outraged at the sight of domineering classes who monopolize the blessings of government—they see very clearly all the existing wrongs, but they do not see the practicable and wise remedies ; and when they hear prudent voices counselling patience, and reminding them that the evil works of centuries, like old forest trees, have deep roots, and cannot be rudely torn out of the bosom of society without endangering its life,

they cry out in their enthusiasm, "these are the voices of the enemies of the people, the voices of priests and aristocrats, away with them to the guillotine!" Only too late do they experience the retribution which God invariably visits upon those who presumptuously seek to drive the chariot of His Providence!

Not one word of what we have said is inapplicable to our own land. We live, move, and have our whole being in the midst of these same perils. Steam, electricity, commerce, and emigration have made us a part of the great European family. Every throb of their heart is felt in our own bosom. We are of their blood and civilization. We have their laws and their religion. We are nurtured by their science and literature. From us they have received more thorough ideas of democratic freedom; but from them we have derived all else that constitutes the intellectual life of man. It would be the height of folly in us to despise the lessons of their experience. Our children should be carefully instructed in all of it. They have a difficult task to perform in perpetuating our institutions as they were shaped by the fathers of the Republic. They must be well trained in the knowledge necessary for that purpose. From what has already been said, it will be at once understood that we do not mean human science alone, *nor principally*. The beginning of wisdom is the fear of the Lord.

This brings us to the consideration of the immediate subject of this article; which can now, we think, be briefly stated; inasmuch as the foundation has been properly laid, if our views are correct as to the principles which we have presented.

Enlightened rulers all over Europe have been profoundly impressed by the lessons of this and the last century. It was once believed by monarchs that to enlighten their subjects would be to imperil their thrones. It is now very clearly seen that "the divinity which doth hedge a king" has long ceased to be an oracle to the people. The French Emperor erects his dynasty upon popular suffrage. Hereditary right has come down from its ancient pedestal to accept from the people the confirmation of its authority. It is now too evident for further doubt, that no ruler can rule modern nations by any appeal to the mausoleum of his ancestors. The garish light of the sun has penetrated every royal tomb, and has altogether annihilated the mystery which once filled the hearts of nations with awe and unquestioning obedience. Public opinion now rules the ruler. Kings and their ministers have now to elect between intelligent and virtuous opinion on the one hand, or revolutionary passions on the other. The wisest of them, therefore, are hastening to educate the people; and they are striving, above all things, to make such education distinctly *Christian*, and not simply *moral*; for, they well remember the fate of all nations who have staked their salvation

upon the sufficiency of the natural virtues. While kings are doing this to preserve the shadow of their royalty from the aggressive spirit of the age, we, in this chosen land, are doing or aiming to do the same thing, in order that we may rear successive generations of virtuous and enlightened heirs to the rich inheritance of our constitutional democratic freedom. Ours should be much the easier task ; as we labor for no dynasty, but strive only to make a nation capable of self-preservation. We are no less in earnest than the kings ; and we may surely examine their work and see what is good in it. The kings tried the pagan idea of intellectual culture adorned with the glittering generalities of moral philosophy ; and they added to it the maxims of the Christian gospel, whenever that could be done without getting entangled in the conflicting creeds of the numerous sects. The school was like Plato's lecture-room, only that the sacred voice of the Evangelist was heard occasionally in such passages as do not distinctly set forth faith and doctrine, about which the scholars could differ. Sectarianism, as it is called, had to be excluded, of course, in a mixed system of popular education, wherein freedom of conscience was conceded to be a sacred right and proselytism was disavowed. The result was twofold : first, tens of thousands of children were deprived of distinct religious instruction and doctrinal knowledge ; and secondly, in countries where the Roman Catholic population was large, though in a minority, other tens of thousands were left without secular education, because their parents would not permit them to be brought up in habits of indifferentism, which means practical infidelity, or trained in knowledge hostile to their religious faith. Prussia, though she is the very embodiment and representative of Protestant Europe, soon came to the conclusion that this would not do—that education must be Christian—that it must be doctrinal and conducive to religious practices—that, as all could not or would not believe alike, each should have full opportunity to be reared in his own faith, to learn its doctrines and to fulfil its duties and discipline—and, therefore, that enlightened government established the denominational system, giving to each creed practical equality before the law, a separate school organization (wherever numbers made it practicable), and a ratable share of the public school-fund ; reserving to the Government only a general supervision ; so as to secure a faithful application of the public money, and to enforce a proper compliance with the educational standard. The public schools are organized so that every citizen shall obtain the complete education of his child, in the faith and practice of his own Church. All difficulties have disappeared, and perfect harmony prevails.

In France, by the last census the population was thirty-seven millions, divided about as follows: 480,000 Calvinists, 267,000 Lutherans, 30,000 of other Protestant sects, and 73,000 Jews ; the remaining thirty-six millions

being either practically or nominally Catholic. Although the dissenters from the national faith are less than one million, that Government has provided for them, at the public expense, separate primary schools, where each sect is at full liberty to teach its own doctrines. There are likewise three seminaries for the higher education of Lutherans and Calvinists.

Austria also supports schools, colleges, and universities for a Protestant minority.

The British Government has likewise adopted the same principle of public education for the Catholics and the Protestant dissenters of England; while, with her traditional and malignant hatred of the Irish people, she still denies them the justice which she extends to all of her other subjects, at home or in the Colonies, even to the Hindoos and Mohammedans of her Indian Empire!

And thus, the most powerful and enlightened nations have decided that Christian civilization cannot be maintained upon pagan ideas; and that the safety of every commonwealth depends upon the Christian education of the people. They have also clearly seen that *doctrines, discipline, morals*, and "*the religious atmosphere*," must be kept united, and made to penetrate and surround the school at all times; and that, however greatly the Christian denominations may differ from each other, or even err in their belief, it is far better for society that their youth should be instructed in some form of Christian doctrine, than be left to perish in the dreary and soul-destroying wastes of deism. Experience has proved to them that moral teaching, with Biblical illustrations, as the piety of Joseph, the heroism of Judith, the penitence of David, will not suffice to establish the Christian faith in young hearts, or to quiet the doubts of inquiring minds. The subtle Gibbon, mocking the cross of Christ, will confront the testimony of the martyrs with the heroes of pagan history. Voltaire did the same for the French youth of the last century, to their destruction. No. The experience of wise governments is this; that *morals* must be based upon *faith*, and faith made efficient in deeds of practical virtue; for, faith worketh by charity. And another experience is this, which is best given in the very words of the eminent Protestant statesman and historian, M. Guizot: "*In order to make popular education truly good and socially useful, it must be fundamentally religious. I do not simply mean by this, that religious instruction should hold its place in popular education and that the practices of religion should enter into it; for a nation is not religiously educated by such petty and mechanical devices; it is necessary that national education should be given and received in the midst of a religious atmosphere, and that religious impressions and religious observances should penetrate into all its parts. Religion is not a study or an exercise to be restricted to a certain place and a certain hour; it is a faith and a law, which ought to be felt everywhere, and which after this manner alone can exercise*

all its beneficial influence upon our minds and our lives." The meaning of which is, that not a moment of the hours of school should be left without the religious influence. It is the constant inhalation of the air which preserves our physical vitality. It is the "*religious atmosphere*" which supports the young soul. Religion cannot be made "*a study or an exercise to be restricted to a certain place and a certain hour.*" It will not do to devote six days in the week to science, and to depend upon the Sunday-school for the religious training of the child. M. Guizot is right. The enlightened governments of Europe have accepted his wisdom and reduced it to practice in their great national school-systems.

Now, the Catholics of the United States have said no more than that ; have asked no more than that ; and yet, a wild cry of anger has been raised against them, at times, as though they were the avowed enemies of all popular education. They pay their full quota of the public taxes which create the school-fund, and yet they possess, to-day, in proportion to their wealth and numbers, more parochial schools, seminaries, academies, colleges, and universities, established and sustained exclusively by their own private resources, than any other denomination of Christians in this country ! Certainly, this is no evidence of hostility to education ! And, why have they made these wonderful efforts, these unprecedented sacrifices ? It is because they believe in the truth uttered by M. Guizot. It is because they believe in the truth established by all history. It is because they believe in the truth accepted and acted upon by the enlightened men and governments of this age. It is because they know that revealed religion is to human science what Eternity is to Time. It is because they know that the salvation of souls is more precious to Christ than the knowledge of all the astronomers. It is because they know that the welfare of nations is impossible without God. And yet, they fully understand how religion has called science to her side as an honored handmaid ; how learning, chastened by humility, conduces to Christian advancement ; how the knowledge of good and evil (the fruit of the forbidden tree) may yet be made to honor God, when the sanctified soul rejects the evil and embraces the good. Therefore the Catholic people desire denominational education, as it is called.

That is the general view of the question ; but there is a particular view, not to be overlooked, and which we will now briefly consider.

The most marked distinction between pagan and Christian society is to be found in the relations which the State bears to the family. Scarcely was the Lacedemonian boy released from his mother's apron-string, when the State seized him with an iron hand. The State was thenceforth his father and his mother. The sanctities and duties of the family were annihilated. Body and soul, he belonged to the Moloch of Power. Private conscience was no more than a piece of coin in circulation ; it was

a part of the public property. Christ restored the family as it existed in Adam and Eve. Christian civilization denies that the State can destroy the family. The family is primary; the father the head; the mother the helpmate; the children in subjection, and for whom the parents shall give an account to the Father in Heaven. The Christian State has no authority, by Divine or human appointment, to invade this trust. It has therefore no mission either to coerce conscience or to dictate the education of it. It is the duty of the State in every way to facilitate, but it cannot arbitrarily control the mental and moral training of the people's children. That right and that responsibility are domestical, and belong to the parent.

Now, the Catholic parent is aware that there are between his creed and all others the widest and most irreconcilable differences, and that it is impossible to open the New Testament, at almost any page, without forthwith encountering the prime difficulty. To read the Bible, without note or comment, to young children, is to abandon them to dangerous speculation, or to leave them dry and barren of all Christian knowledge. In mixed schools there is no other recourse; because it is impossible to make any comment upon any doctrinal teaching of Christ and his Apostles, without trenching upon the conscientious opinions of some one or other of the listeners. "The Father and I are one,"—"the Father is greater than I"—here at once we have the Unitarian and the Trinitarian at a dead-lock! "This is my body;" "It is the spirit which quickeneth, the flesh profiteth nothing;" here we have the primitive Lutheran, who believed in the real presence (*consubstantially*), and his Calvinistic coadjutor in Reform squarely at issue! "Unless you be born again of water and the Holy Ghost," etc.—here we have the Baptist and the Quaker very seriously divided in opinion. Nevertheless, widely as they differ the one from the other, there is a fundamental assimilation between all the Protestant sects, which may render it possible for them to unite in one educational organization; and yet, we find many of the most enlightened and earnest among the Protestant clergy in America now zealously advocating the denominational system, such as we find in the European countries above referred to. They believe that education should be distinctly based upon doctrinal religion; and they are liberal enough to insist, that, by natural right, as well as by the constitutional guarantees of our free country, no doctrine adverse to the faith of a parent may lawfully be forced or surreptitiously imposed upon his child. It is well known, however, that, between the Catholic faith and all Protestant creeds, there is a gulf which cannot be bridged over. It would, therefore, be simply impossible to adopt any religious teaching whatever in mixed schools, without at once interfering with Catholic conscience. No such teaching is attempted, as a general rule,

we believe, in the public schools of the United States ; and hence we have only a vague announcement of moral precepts, the utter fruitility and barrenness of which we have already alluded to. Catholics, agreeing with very many enlightened and zealous Protestants, believe that secular education, administered in that way, is not only vain, but eminently pernicious ; that it is fast undermining the Christian faith of this nation ; that it is rapidly filling the land with rationalism ; that it is destroying the authority of the Holy Scriptures ; that it is educating men who prefix "Reverend" and affix "D. D." to their names, the more effectually to preach covert infidelity to Christian congregations ; that, instead of the saving morality of the Gospel of Christ, which rests upon revealed mysteries and supernatural gifts, it is offering us that same old array of the natural virtues or qualities which pierced, like broken reeds, the sides of all heathen nations. And more than this, Catholics know by painful experience, that history cannot be compiled, travels written, poetry, oratory, or romance inflicted upon a credulous public, without the stereotyped assaults upon the doctrines, discipline, and historical life of their Church. From Walter Scott to Peter Parley, and from Hume, Gibbon, and Macaulay, to the mechanical compilers of cheap school-literature, it is the same story, told a thousand times oftener than it is refuted ; so that the English language, for the last two centuries, may be said, without exaggeration, to have waged war against the Catholic Church. Indeed, so far as European history is considered, the difficulty must always be insurmountable ; since it would always be impossible for the Catholic and the Protestant to accept the same history of the Reformation or of the Papal See, or the political, social, and moral events resulting from or in any degree connected with those two great centres and controlling causes. Who could write a political history of Christendom for the last three hundred years and omit all mention of Luther and the Pope ? And how is any school compendium of such history to be devised for the use of the Catholic and Protestant child alike ? And, if history be philosophy teaching by example, shall we expel it from our educational plan altogether ? Or shall we oblige the Protestant child to study the Catholic version of history, and vice versa ? Certainly, it is quite as just and politic to oblige the one as the other ! Shall the "*majority*" control this ? Who gave the "*majority*" any such power or right ? With us, the "*majority*" controls the "*State* ;" and we have seen that the "*State*" becomes a usurper when it attempts this ! We are quite sure that, if the Catholics were the "*majority*" in the United States, and were to attempt such an injustice, our Protestant brethren would cry out against it, and appeal to the wise and liberal examples of Prussia and England, France and Austria ! Now, is it not always as unwise, as it is unjust, to make a minority taste the bitterness of oppression ? Men governed

by the law of divine charity will bear it meekly, and seek to return good for evil ; but all men are not docile ; and majorities change sides rapidly and often in this fleeting world ! Is it not wiser and more politic, even in mere regard to social interests, that all institutions, intended for the welfare of the people, should be firmly based upon exact and equal justice ? This would place them under the protection of *fixed habit*, which in a nation is as strong as nature ; and it would save them from the mutations of society. The strong of one generation may be the weak of the next ; and we see this occurring with political parties within the brief spaces of Presidential terms. Hence we wisely inculcate moderation and justice in political majorities, under the law of retribution.

Profoundly impressed with these views, and impelled by this commanding sense of duty, our Catholic people have created a vast network of schools over the country, *at a price* which the world knows little of—the sacrifice which the poor man makes, who curtails the wheaten loaf that he may give to his child the spiritual bread ! Ah ! how many humble cottages and dreary tenement-houses could testify to that ! There are six millions of them here now ; and still they come, from the deserted hearths beyond the seas. They are upright, industrious, and love the new land like the old ! In war they shoulder the musket ; in peace they are found filling every avenue of labor and enterprise. They contribute millions to the public revenue, and hundreds of millions to the productive industry of the country. Their own welfare, and the highest interests of the country demand that their children and their children's children should be well instructed in secular learning, and thoroughly grounded in moral and religious knowledge. As we have shown, they cannot avail themselves of the public school system, as now organized, though they contribute largely to its support by their taxes. *They do not desire to interfere with that system*, as it seems at present to meet the wants, or at least the views of their Protestant fellow-citizens ; and they are, therefore, *not* “opposed to the common schools” in the sense in which they have been represented to be. They simply ask that they may be allowed to participate in the only way open to them, that is, by the apportionment to them of a ratable part of the fund, in aid of their existing schools, and of such others as their numbers, in any given locality, may properly enable them to establish, subject to the limited supervision of the State, as we have before explained. We need go no further than Canada, to witness this system operating harmoniously and to the best advantage. The argument generally used against it is, that this would destroy the unity and efficiency of the whole. Why is it not so in Prussia, Austria, France, England, and the British Colonies ? Besides, the Catholic populations in this country are very much aggregated, as in Baltimore, Philadelphia, Boston, New York, Brooklyn, Cincinnati, St. Louis, Chi-

cago, Milwaukee, and in the large agricultural settlements throughout the Northwestern States. Certainly, in such localities there could be no difficulty. It is contemplated by the school law that all these are to be educated. Then, why can they not be permitted to organize separate schools, as in the countries referred to? Such organization would be an integral part of the whole system; and the cost would be precisely the same. In fact, we learn from the Reports of Assistant Superintendents Jones and Calkins, made to Hon. S. S. Randall, the City Superintendent, and also from his Report made to the Hon. Board of Education, in December, 1866, that the school room provided in the City of New York (especially in the primary department) is altogether inadequate; and yet, we know that tens of thousands of Catholic children could easily be cared for, if the means were afforded those, who, even now, with the scantiest resources, are erecting parochial schools all over the city.

It would be impossible, in a brief article, to enter into details. Our purpose has been rather to set this question before a liberal public in its great leading aspects, as we are quite willing to trust to the wisdom and experience of our legislators to devise the proper plan and specifications. They will be at no loss for precedents. The statute books of half a dozen countries may be consulted profitably. All we ask is, that this momentous question may be candidly considered and justly and generously disposed of. We hope that the day has gone by when such a question as this shall be met with passionate declamation or the obsolete cry of "no-popery." Disraeli has failed to stem the tide of popular Reform in England by reviving the insane clamor of Lord George Gordon. The world has outgrown such narrow bigotry. Vital questions, affecting the conscience and the rights of multitudes of men, and deeply involving the welfare of nations, must henceforth be settled by calm and just decisions. Christendom will tolerate nothing else now. And, surely, this free and wise Republic will not be the last to put into practice those principles of equality before the law, justice, and generous confidence in human nature, which it published to all the down-trodden nationalities of the Earth, almost a century ago, over the signatures of Hancock, Livingston, and Carroll of Carrollton.

It is a great point gained, if we give the mind a desultory familiarity with every subject to which at length the attention is to be strenuously directed; for it is by this means, chiefly, that we are to guard against those rigid intellectual habits, and those exclusive professional tastes, which when once formed are seldom if ever broken up, and which render high attainments so often the means rather of narrowing than of expanding the mind.

THE NOMINAL SCHOOL AND THE SCHOOL OF THE WORLD.

MORE or less conscious in the minds of a large class of intelligent people there exists a spirit of criticism which prompts the drawing of comparisons between the importance respectively of the nominal school and the school of the world. Said a fair representative of this class—a New York financier of high standing in business and social life, one who, in early life, had had but scanty experience of the nominal school—whose education had, indeed, been almost entirely acquired in the school of the world, a man of refined manners and good conversational faculty—to one who had been lauding the nominal school to the disparagement of the school of the world: “Without going to school one may learn all that is necessary to fit him for the duties of life. He may learn to speak and write correctly without becoming acquainted with the rules of grammar or rhetoric or logic. The public journals, from among which one has the right to choose; the rostrum, the stage, the picture-gallery, science, art, the great world itself,—all are at the command of a man’s pocket. Men meet, and their minds collide and give one another polish; or commingle and multiply facts and opinions, to the enlargement of the views of each mind and the attainment of truth by the general mind. And what becomes of your graduate after his year of study in the schools? He is shut up. He is shut out from the world, unacquainted with the world, exercising little influence in directing and controlling the affairs of the world. He is not what the world needs. He has not fitted himself for the world. In many cases *he becomes a mere teacher of boys.*”

To what extent the concluding remarks spring from that spirit of jealousy which exists in the mind of the business class for the schooled class, is for the observer of human nature to decide. The final remark will, perhaps, serve only to show in what estimation a wealthy and intelligent man of business may hold the hard-working class composed of teachers. That the speaker uttered some truth will no doubt be clear enough to any one.

The important fact to which he called attention was this: that a man may, without going through the nominal schools, become fitted to fill gracefully some of those spheres wherein the highest intelligence is requisite. The world knows precisely what it wants in order to its highest advantage, so far as convenience is concerned; and schooling in the world tends to fit a man to supply the want. The schooling of the world and the schooling of the nominal school differ chiefly perhaps in this,

that the nominal school teaches the pupil principles for their own sake ; the world, for the sake of applying the principles to the world's use. The pupil of the nominal school looks over the world for the sake of knowledge ; the business man for the sake of knowledge, calculation, and execution. In mathematics, metaphysics, and other sciences, the pupil of the nominal school may find an opportunity for mental gymnastics other than what relates to the memory. But he engages therein either under compulsion, emulation, or love of study—motives that singularly fail with a large class of pupils. The business man has not only these motives, but the additional motive of securing wealth and position.

There is no doubt that the man nominally schooled has an original advantage over him who is not so schooled. Let the two enter upon active life at the same time, the one schooled, the other unschooled—the two being equally gifted by nature and blessed in circumstances, and equally practical—and we have no doubt that the schooled man would excel in the race. He would have a superior consciousness, such as would enable him more readily to recognize and classify what his eyes would rest upon ; and a training such as would prepare him better for calculation and enterprise.

Yet the man who has been schooled in the world is better prepared for immediate action in the world ; and therein a man may be so schooled, without the advantages of nominal schooling, as to be fitted for the positions which in the eyes of the world are of primary importance—positions that require broad intelligence and a high order of intellect, and which, accordingly, command the highest respect.

It is clear that the world not only develops in the mind, to a much greater extent than does the nominal school, most if not all of the principles that are taught in the latter, but it really does more. It teaches much that the nominal school does not teach—principles and practices that are essential to the convenience of the world ; and it is a question of the utmost importance whether it is not really so outstripping the nominal school in effectiveness that intelligent parents will come to consider it expedient to shorten their children's course of nominal study, in order to hasten their entrance upon the sphere where they may learn more of what is essential to success, in a briefer period of time.

It is no doubt true that the world is now in a condition to teach nominal teachers what to teach ; to suggest a reformation of vital importance in the character of the curriculum of study.

The fact that the world has been self-taught, and that almost wholly unconsciously, is in favor of the suggestion that our teachers should learn from it what to teach. They may look upon it as the naturalist looks upon nature—not to teach, but to learn.

The school holds a high position in the esteem of men ; but it stands

before the world in the mediæval gown that commands reverence more for its mystery than because it is understood. It has made and is still making progress; but notwithstanding its progressiveness, it has clung to tradition and prejudice, and has settled down too much in dead mechanism. It still regards the puerile as essential; formality as the sign of intellect; nominal study as the badge of exclusiveness; the grave-clothes of the past as becoming habiliments for the outdoor business of the living present.

It is when things are in such a state that reforms come. The signs of the times denote that a reform in matters pertaining to the nominal school is at hand. Some schools are anticipating the reform, and are beginning the work themselves. We believe they will find ample recognition and support.

SCHOOL COMMISSIONERS' DUTIES IN CONNECTION WITH TEACHERS' INSTITUTES.

SOME months ago we had the pleasure of calling the attention of teachers in the rural districts to certain suburban refinements in methods of conducting Teachers' Institutes.

Another session of the same Institute affords an equally good text for, and illustration of, the duties of commissioners in connection with such meetings: that is, as developed by the honorable officers through whose exertions the Institute of last year was indebted for its peculiar excellence and great success.

It is proper for us to state just here, by way of explanation, that in our article of last February, the honors of the occasion were somewhat unjustly distributed. Sufficient distinction was not made between the three commissioners who presided on that occasion. They were commended as a body, whereas the credit was really and wholly due to two of them—the two whose conduct was so conspicuously exalted at the recent meeting, and whom we now propose to hold up for the encouragement and emulation of less progressive Guardians of Education. The third commissioner in no wise deserved to share their laurels. In fact, with singular perverseness, he did all he could to resist the innovations of his spirited associates in office, but was powerless to check their career.

This year the two exalted commissioners—evidently discouraged and provoked by our failure to render them strict and undivided honor last year—determined not to make another effort. But the Department of Public Instruction was inexorable. It insisted on the fulfilment, partially at least, of the requirements of the law. And what made matters

worse, one of the most efficient and experienced teachers of the State was sent to conduct the Institute. Finding it impossible to escape the imposition, the two champions of the educational rights and privileges of their respective districts fired up for the occasion, and soberly set to work to counteract the efforts of the Conductor and the influence of Commissioner number three, who, with equal obstinacy, and greater success than last year, stuck close to the institute, and worked hard all the time to keep the members at the old-time drudgery of hearing instruction and discussing questions of school management.

Thus opposed by their associate in office, the Conductor sent by the Department, and above all, by the great body of teachers who would not share their inspiration, the two commissioners were not so successful as they had hoped to be. Yet their efforts were so spirited in character, so original, and withal so creditable to the office, that we deem them worthy of the emulation of all school-officers whose duty calls them to preside at teachers' meetings. Indeed, we have thought it not improbable that there might be deduced from them certain general rules of duty which would be of very great service to officers of inferior spiritual elevation and experience. With this intent, we submit the following :

Rule 1. It is the duty of Commissioners to test the professional zeal and the moral courage of teachers when institutes are in session.

A nice way to do this is to stand on the steps, or in the bar-room, of the nearest public house, and address inquiring teachers with : "Go'n to th' Institute, hey? 's across th' r-road, there ; 's a one-horse affair, 'n don' amount to much !"

Rule 2. It is the duty of Commissioners to test the patience, presence of mind, and temper of the instructors of institutes.

This may be done by coming into the meeting and engaging in loud talking, and chattering with such girls as are willing to join with them, or are afraid to resent the interruption. And when the Conductor, not knowing that the disturbance is "official," politely asks for quiet, and attention to the teacher, the Commissioner should jump up and say, as snappishly as he may be able to—"I presume you mean *me*, sir ! I have a *right* to talk here, and *shall* talk !" And when the Conductor proceeds to say that he was not aware before who caused the disturbance, the Commissioner should interrupt him by snarling : "I was not disturbing anybody, sir ! I have a right to talk here, and have no apologies to make !"

Rule 3. It is the duty of Commissioners to encourage teachers to visit schools in neighboring towns while the Institute is in session.

It is not at all necessary on such occasions to consult the Conductor of the Institute, so that the projected visits shall not interfere with his order of exercises. The Conductor will be highly delighted at any time

to have his classes broken up by such timely and praiseworthy excursions. That a larger number of teachers may be led away, it is a good plan to *solicit* invitations to visit schools, from Boards of Education, who, without such official incitement, might not think it the proper thing to divert the teachers in that way from the ordinary routine of Institute exercises.

It is a good plan also, if proper secrecy is exercised, to let a few friends know that the excursion is planned "just to break up the d—— thing."

Rule 4. While it is the duty of Commissioners to grant certificates to such as apply therefor and are found on examination to be duly qualified, it is a special duty of these officers to take the applicants (in classes as small as the candidates dare form, especially if they are young ladies) into a convenient class-room, and then and there address them, on any subject that is not professional, in the highest style of spiritual exaltation, that their desire for certificates will enable them to listen to.

Should any candidate object to the discourse, or manifest her natural disgust at that sort of proceeding, she deserves to receive no certificate. Should any teacher, holding a certificate, give offence to a Commissioner (at the Institute or elsewhere), it is the duty of that officer to annul her certificate. If the certificate be from the State, and thus above the Commissioner's reach, he may inspire the offending teacher with a wholesome respect for his authority by condemning her school-house.

Rule 5. When Commissioners, returning from a protracted absence from an Institute, find that the Conductor, and the Commissioner who has faithfully aided him from the beginning, have decided to cut short the period of the Institute, it is the duty of the said Commissioners to set upon the Conductor and insultingly demand by what authority he presumes to do such things without consulting them.

And that Commissioner who is fullest at the time, may divide his efforts between maintaining an upright posture, and giving the Conductor to understand that the Department had ordered that the Institute be held "*a full week*,—underscored, sir! *A FULL WEEK*;" and that the Commissioners are in duty bound to see the order carried out.

Rule 6. When the Conductor stubbornly, though politely, declines to hold the Institute after five-sixths of the members shall have gone away—thus frustrating the Commissioners' conscientious desire to obey the instructions of the Department—it is the duty of the Commissioners to concert a plan by which to "break up the Institute in a row."

Rule 7. In the fulfilment of this laudable determination, it is the Commissioners' duty to cease to bless the Institute with their absence. They should appear upon the scene, full of inspiration for the good cause, wind their way to the Conductor's stand, demand the rolls, and proceed to sit in judgment thereon.

With judicial gravity and sobriety, they should spell over the record, while the Conductor is addressing the assembled teachers; and after much deliberation and no little talking in under-tone, they should demand that the teachers who have been absent with them, shall be enrolled as "present."

The Conductor will have to be a gentleman of infinite suavity and firmness and tact, to succeed in maintaining his position and at the same time stave off the impending "row."

Rule 8. When the time fixed for adjournment draws nigh, and the Conductor politely offers the members of the Institute an opportunity to make such remarks as they may feel inclined to, it is the duty of the Commissioner self-appointed to begin the disturbance, to deliver himself of a maudlin harangue, alike insulting to the Conductor of the Institute, the Commissioner who had supported him, and the teachers who have zealously sustained them both.

Rule 9. When the Commissioner appointed to follow in the assault, proceeds to "pitch in promiscuously," and finds himself neatly flanked by a quick-witted young lady who proposes a vote of thanks to the Conductor, which the teachers take up and carry with hearty unanimity, thus calling out a response from the Conductor who completes the victory by promptly asking for "Old Hundred;" it is the duty of the said Commissioner to succumb gracefully, to steady himself by a firm hold of the Conductor's hymn-book, and serenely blend the incense of his breath with that of the victor, joining vigorously with him in the closing hymn. Such pious resignation to the dispensation of Providence is peculiarly impressive: especially to such as are permitted to witness the after scene, when Commissioner No. 1 berates Commissioner No. 2 for failing to come to time; and Commissioner No. 2 justifies the failure by sputtering: "D— 'im; he didn't gi' me a chance!"

Rule 10. (Optional.) When the teachers are assembled, the evening of adjournment, for a quiet, social reunion, it is the duty of the Commissioners to introduce each other to the lady teachers of their respective districts.

And when a sensible and sensitive young lady is honored by an extension of official acquaintance (which she dares not decline), it is a very handsome thing for the Commissioners to stand by and pass tipsy comments on her loveliness, and brag of her as "the prettiest girl in the country." Young ladies of ordinary refinement cannot fail to be pleased at being called "a sweet creature" in such a delicate way, by men whose official position alone would justify their appearing in her presence. Should the assembled teachers fail to appreciate the efforts of the Commissioners to give *tone* to the meeting, and manifest their perverted taste by systematically "snubbing their superiors," the proper course for the

latter to pursue, is to retire to another apartment and there refresh themselves in private—concocting meanwhile such schemes for the elevation of the teachers, as the inspiration of the occasion may naturally give rise to.

We might enlarge upon these several duties of School Commissioners, but it will not be necessary. It would be easy also to increase their number; but we are afraid of discouraging aspiring officers by an over-long lesson. Any Commissioner who shall emulate the example of these suburban guardians of the minds and morals of the rising generation, and faithfully observe the few rules we have set down, will richly deserve with them the special consideration of the powers that be.

THE TEXT-BOOK DESPOTISM.

IT is noticeable how, in using a good thing, we are sure at last to abuse it. As a striking example of this human weakness, we refer to the manner in which we have turned the school text-book from a servant into a master.

The original design of a text-book is a serviceable one. The design is to present within a small space the principles of a sphere of knowledge in their latest developments and applications, so that the pupil may have the principles at hand to refer to when the teacher is absent.

But we have come to use these books as the superstitious use their printed forms. What the text-books contain is truth; everything that rises spontaneously in the mind or that is contained in other books is to be ignored. A case is just at hand. It is that of a young lady who was undergoing examination for graduation from a normal school. The question was put, "What is law?" and she dared not insert in her answer a reference to the two elements of law, direction and control, for fear the answer would be marked as incorrect, since in the text-book in use no reference was made to these two elements. Another instance presents itself. A senior student in a certain college, a young man of superior attainments in rhetoric, when undergoing oral examination before his Professor, replied to a question out of the realizations of his own mind, quoting, at the same time, language of a number of text-books, and this, too, in obedience to the rhetorical law of completeness. The Professor, who had the text-book of the college before him, interrupted the student. "It isn't here," said he, pointing to the page before him, and grimly smiling. And the remark and grimness indicated the low grade at which the student was to find himself marked on graduation.

This text-book despotism represses the student's originality and mechanizes him. It is clear that it retards education. One of the evils which it conditions, is the opportunities which it opens up for incompetent men to get behind the teacher's desk. An ignoramus "may hear a recitation," and this despotism tends to render the work of teaching a mere process of "hearing recitation."

The text-book despotism excludes the magnetic contact, by means of the living voice—the mind that knows with the mind that learns; which, after all, is the mode of normal teaching. In these latter days, it is serving to bring into existence an enormous quantity of charlatan text-books, all of which, in spite of the critic's warnings, find a sale and a place, and work their pernicious work.

WEBSTER REVISED.

PROFESSOR.—One who makes an avowal of his belief in Scripture; especially an officer in a college or university, whose business it is to instruct students in a particular branch of learning. [*Obsolete.*] A person who is skilled in breaking horses. One who is an adept in sleight-of-hand performances. A teacher of the art of self-defence. A teacher of the art of French cookery—example, Prof. Blot. In fine, the title may be applied to any jackass who has the boldness to assume it.

DOCTOR OF DIVINITY.—A title conferred on a person of profound learning, who has written some work on theology, or by study and research has contributed largely to the fund of Bible knowledge. [*Obsolete.*] A title affixed to the name of a Christian minister having the same force as Reverend prefixed. One of the honorary degrees conferred indiscriminately by colleges on ministers of the Gospel.

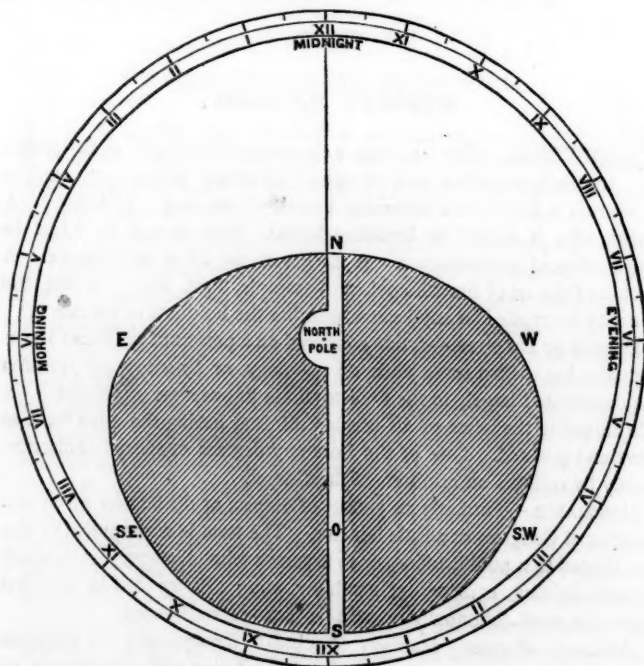
HONORABLE.—Formerly an epithet of respect or distinction given to a member of Congress or a State Senator. The term is now applied to any one elected to a public office, or to a person who distinguishes himself in prize-fighting, embezzling, gambling, etc.; also applied in any case where the word *dishonorable* would be more correctly used.

COLLEGE.—Formerly a society of scholars incorporated for purposes of study or instruction; an educational institution with the powers of conferring degrees on its graduates. Now, a school for the instruction of boys in bookkeeping; a boarding-school, where young ladies are taught music, drawing, etc.; any educational institution where, in addition to a primary and "common English" department, Latin and Greek are studied.—*The College Courant.*

EASY STAR-STUDIES.

THE newer methods of research, and the late important discoveries in Stellar Astronomy, have excited a new spirit of inquiry respecting the more general facts of the science, and moreover, have created a demand for better facilities for acquiring the fundamental truths.

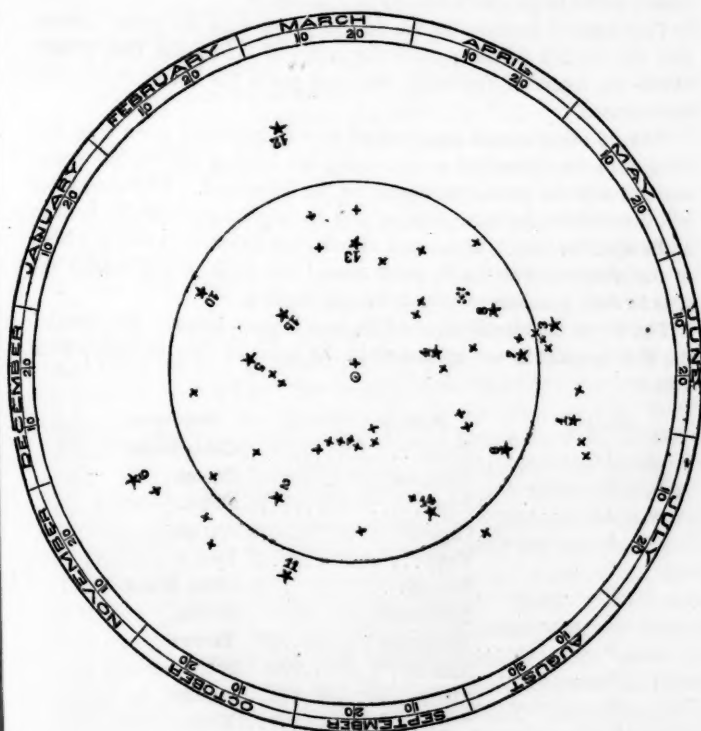
Among the many new and excellent works upon Astronomy, only one or two have afforded the student the means of identifying the fixed stars, while it is among these bodies that scientists are pushing their investigations with such astonishing success.



To be informed through the public journals, as we have been recently, that the star Aldebaran contains Iron and Antimony, but no Tin or Lead,—to be assured that Sirius is moving away from us at a rate far swifter than the earth's motion—and to be told that this bright star has slowly changed from red to white, stimulates a desire in the general reader to acquire a sight acquaintance with these objects of interest.

This desire is not readily gratified at the usual sources of scientific knowledge. The school text-books afford no satisfaction, and the consultation of a star chart or globe, by the inexperienced star-hunter, only results in bewilderment.

Science would be benefited by a more widespread familiarity with the names of the brighter stars. An unscientific casual observer who can describe a meteor's path by its proximity to familiar stars, may render an important aid to the astronomer.



Among the several methods employed by learners, the device known as the movable Planisphere is probably the best.

The honor of the invention of this instrument is due to the celebrated astronomer Bode, who produced, in 1786, a circumpolar map, to be used in connection with a transparent disk, upon which was a marked horizon. The two being adjusted to each other, according to certain

specific directions, the stars visible at any particular given time appeared within the horizon of the disk.

In our modern instruments an opaque card, with an oval open space, has taken the place of the transparent card. This form is believed to be the invention of M. Baudin, a French engineer.

A modification of this form accompanies the present article. The stars of the 1st and 2d magnitudes, only, being given, it is believed that many will accomplish by these simple means the labor which the complexity of the larger charts renders formidable.

To prepare it for use: cut the smaller circle from the paper; cut out also the shaded portion; place the centre of the smaller disk directly above the centre of the larger one, and put a pin accurately through both centres.

Now, to bring to view the principal stars visible at any given night and hour, turn the upper card so as to bring the hour of observation to correspond with the given time of year on the lower card. The open space will then exhibit the stars of the 1st and 2d magnitudes above the horizon at the specified time. If the card be held face downward above the head of the observer, with the N. point toward the north, it will exhibit the stars in their positions relative to the real horizon.

The key to the identification of the stars is given below. The stars of the first magnitude are numbered in the order of their brilliancy from 1 to 15.

<i>Number.</i>	<i>Name.</i>	<i>Constellation.</i>
1.....	Sirius.....	Canis Major.
2.....	Arcturus	Bootes.
3.....	Rigel.....	Orion.
4.....	Capella	Auriga.
5.....	Vega.....	Lyra.
6.....	Procyon	Canis Minor.
7.....	Betelgeuse.....	Orion.
8.....	Aldebaran.....	Taurus.
9.....	Antares	Scorpio.
10.....	Altair.....	Aquila.
11.....	Spica.....	Virgo.
12.....	Fomalhaut	Piscis Australis.
13.....	Alpheratz	Andromeda.
14.....	Regulus	Leo.
15.....	Deneb.....	Cygnus.

The stars of the 2d magnitude may be located by aid of those of the 1st. Beginning with Alpheratz, No. 13, which is nearly on the first meridian, and proceeding eastwardly, we have, a little to the northwest, *Mirach* of

the constellation Andromeda ; still further in a southeasterly direction is *Mesartim* in Aries ; still further in the same direction and near the Equator, is *Menkar* in constellation Cetus. Between Menkar and the North Pole, about midway, are two stars near each other. They belong to the constellation Perseus ; the most northerly is *Marfak* : the other is *Algol*, the most remarkable of the variable stars ; once every two days and twenty-one hours it fades from the 2d magnitude to the 4th—diminishing in twenty minutes and recovering its brightness in seven hours. The reader may see Algol at its period of minimum brightness at a quarter past seven in the evening (New York time), on the 3d of the present month ; or at a quarter before nine, P. M., on the 23d. On both of these occasions Algol will be found very near the zenith.

Near Capella (4) is *Menkalina* in Auriga : south of Capella is *El Nath* in Taurus. West of Betelgeuse is *Bellatrix* in Orion. The three stars in a row forming "Orion's belt" are named—beginning with the one on the Equator—*Mintika*, *Al Nilam*, and *Al Nilak*. The belt measures just three degrees : it points out Sirius on the one side and Aldebaran and the Pleiades on the other. Between the belt and Sirius is *Mirzam*, while beyond are *Wezen* and *Aludra*, all of the constellation of Canis Major. Between Procyon (6) and the North Pole are the two stars *Castor* and *Pollux* of the constellation Gemini ; Castor is the more northerly and the brighter. Below the equator, and southwesterly from Regulus, is *Alphard* of the Hydra. Northeast of Regulus is *Al Gieba*, and due east is *Denebola*, both in Leo. The seven stars of "the Dipper" are named—commencing with the outermost one of the bowl—*Dubhe*, *Merak*, *Phaed*, *Megrez*, *Alioth*, *Mizar*, and *Alcor*. Megrez is of the 3d magnitude. The two stars below the equator, southeasterly from Arcturus (2) are *Alpha* and *Beta* of the constellation Libra. Near Antares (9) is *Ikkil* of Scorpio. Nearly between Antares and Arcturus is *Unuk-al-hay* in Serpens ; a little further north is *Alphecca* of the Northern Crown. The two stars a little to the northwest of Vega, are *Rastaban* and *Elamin* in Draco, the former being the most westerly. Nearly south of them, and nearly between Vega and Antares is *Ras-al-hague* of the constellation Serpens. Three stars form, with Alpheratz, a square, called "the square of Pegasus." The star directly south of Alpheratz is *Algenib* ; west of Algenib is *Markab* ; north of this is *Scheat*. This closes the list of stars of the 2d magnitude. As in case of the 1st magnitude these stars are quite unequal in brilliancy, and astronomers differ somewhat about the number to be included in the list. Castor is sometimes counted as a first magnitude star.

A brief experience with the Planisphere will lead the learner to an acquaintance with the stars described above ; after which, the location of objects by aid of star-maps is easy.

RICHARD GRANT WHITE'S "RELIABILITY."

IN his essay on "Words and their Uses," in the December number of the *Galaxy*, Mr. White says, that *reliable* "is conspicuous among words that are not words," being "anomalous in position and incongruous in formation; that adjectives in *able*, or its equivalent *ible*, are formed from verbs, the passive participle of which can be united with the meaning of the suffix in the definition of the adjective;" as, *lovable*, that may be loved, or *legible*, that may be read; whereas *reliable* does not mean that may be relied, but that may be relied *upon*, and therefore should, analogically, be *reliuponable*. This is the common objection; and hence many writers studiously avoid the use of the words *reliable*, *reliability*, *unreliable*, etc., using *trustworthy*, *trustworthiness*, etc., in their stead. The objection, however, is, to say the least of it, entirely uncalled for. It is founded in ignorance; for *reliable* by no means stands alone. Witness the following, which may all be found in Worcester's Unabridged Dictionary.

ANCHORABLE, capable of being anchored *in*; as, "The sea, everywhere twenty leagues from land, is *anchorable*."—*Sir T. Herbert*.

AVAILABLE, that may be availed *of*, or used to advantage; as, "Our entire *available* force was little less than 6,000."

BOATABLE, that may be boated *over*, or passed over in boats; as, "*Boatable* waters."

COMPLAINABLE, to be complained *of*; as, "Though both be blamable, yet superstition is less *complainable*."—*Feltham*.

DEMURRABLE, that may be demurred *to*, or objected to; as, "A *demurrable* point."

DISPOSABLE, to be disposed *of*; as, "The office is not *disposable* by the crown."—*Burke*.

INQUIRABLE, capable of being inquired *into*; as, "There may be many more things *inquirable* by you."—*Bacon*.

LAUGHABLE, that may be laughed *at*; as, "Perseus was not a *laughable* writer."—*Dryden*.

UNACCOUNTABLE, that cannot be accounted *for*; as, "There has been an *unaccountable* disposition of late to fetch the fashion from the French."—*Addison*.

UNREPRESENTABLE, that cannot be repented *of*; as,

"—vile, unrepented deeds,
Now *unrepentable* for evermore."—*Pollock*.

We do not say that these are all the words of this class there are in the language. There may be others. Mr. White himself gives another,—

livable, in the sense of "capable of being lived in." If he will use his eyes a little, he may find more. The above, however, are enough to show the shallowness of the objection that *reliable* "is anomalous in position and incongruous in formation."

We confess that, for our part, we have a special liking for *reliable* and its cognates. We glory in Saxon words, and admire them for their strength and the heart there is in them; but, for all this, in four cases out of five, we prefer *reliability* to *trustworthiness*, and *unreliable* to *untrustworthy*. Persons, we may trust as well as rely upon; but things, we rely upon rather than trust. Hence, while a man may be trustworthy or reliable, his word is reliable rather than trustworthy. In accordance with this, we might speak of a "trustworthy witness;" but we should unhesitatingly prefer to speak of his testimony as "reliable."

Mr. White attempts to make it appear that *laughable*, one of the words in the foregoing list, is formed from the noun, rather than the verb, *laugh*. But his reasoning on this point shows his entire want of acquaintance with the facts in the case. It is really laughable.

After saying unqualifiedly that "adjectives in *able*, or its equivalent *ible*, are formed from *verbs*," and conjecturing that *laughable* may be an exception to that remark, and adducing *comfortable*, *forcible*, *seasonable*, *leisureable*, *fashionable*, *treasonable*, *objectionable*, and *risible*, as adjectives formed from nouns or "formed upon nouns," he makes the following remarkable statement. "The fact is that, excepting the very few adjectives in *able* or *ible* thus formed upon nouns, most of which I have cited above, and which I believe are only about fifteen in number, every one of the multitudinous class of adjectives formed by this suffix, a class which includes nearly if not quite nine hundred words, is formed upon a verb transitive, and may be defined by the passive participle." This language is precise. It demands the unquestioning assent of the reader; for he naturally says to himself, "No one would make such a statement, especially would not Mr. White, if he did not know whereof he was speaking." And yet, "the fact is," Mr. White, this sentence of yours contains no fewer than four misstatements:—1. That you "have cited *most* of the adjectives in *able* formed upon nouns." "The fact is," that of words of this class, not including those that are obsolete, given in Worcester and the enlarged Webster, there are, instead of "only about fifteen," at least fifty-six; and if we include the compounds of these in *dis-in-*, *super-*, and *un-* (and these are properly so many additional words), we shall swell the list to at least eighty-four.¹ 2. That, excepting the foregoing, "*every*

¹ We give, for the satisfaction of our readers, a list of the words referred to. Actionable, argumentable, bankable, carriageable, charitable, (un-) clergyable, commonable, companionable, (un-) concordable, confluxible, congeable, conscionable, (un-) creditable, (dis-) custom-

adjective in *able* or *ible* is formed upon a verb transitive;" and, 3, "May be defined by the passive participle." To show how well fitted Mr. White is for giving instructions on little points of this kind, we give the following examples. And they are but a few out of the many that might be given. *Compliable*, disposed to *comply*,—a verb intransitive. *Transpirable*, that may *transpire*. *Ulcerable*, that may *ulcerate*. *Perishable*, liable to *perish*. *Durable*, that may *last*. 4. That of adjectives formed from verbs there are "nearly if not quite nine hundred." It is true that, in this case, as in the other, Mr. White errs on the safe side; he understates rather than overstates. But the reader should bear in mind that Mr. White assumes to state "facts." He introduces the sentence with the language of one who is supposed to know—"the fact is." And yet the whole statement seems more like conjecture than anything else. Instead of nearly nine hundred, there are about ten hundred and fifty; to which if we add, as we should, compounds in *bi-*, *circum-*, *dis-*, *il-*, *im-*, *in-*, *inter-*, *ir-*, *over-*, *re-*, *sub-*, *super-*, *tri-*, and *un-*, we shall find we have about sixteen hundred. Thus, the entire number of English adjectives in *able* or *ible*, not including obsolete words, will be seen to be very nearly seventeen hundred.

THE VENTILATION AND WARMING OF SCHOOL-HOUSES.

TO explain clearly and comprehensively the difference in effect between warming a room by introducing currents of heated air, and warming it by direct radiation from hotter bodies exposed in the room, I find to be a matter of much difficulty. It is, however, one of great importance in forming a correct judgment upon the best means of warming and ventilating a school-house. No more difficult problem is

able, (un-) dutiable, effluvia, (in-) exceptionable, (un-) exuviable, fashionable, (un-) favorable, (un-) flammable, (in-, unin-) heriotable, homageable, hospitable, (in-) impressionable, justiciable, laminable, marketable, marriageable, (un-) medicinal, merchantable, (un-) objectionable, (un-) palatable, (un-) peaceable, (un-) perditionable, personable, pleasurable, powerable, profitable, (un-) razorable, reasonable, (un-) remediable, (ir-, un-) reputable, (dis-) salable, (un-) seasonable, (un-) serviceable, (dis-, super-, un-) sizeable, sociable, (in-, un-) statutable, (un-) suspensible, treasonable, valuable, (in-) vaporable, veritable, voyageable. We do not include in this list Mr. White's *comfortable*, *forcible*, *laughable* and *risible*; nor do we insert Hudibras's *untriumphable*, or a number of other words that some would be inclined to place here. Enough are given to show that Mr. White's enumeration is wide of the mark.

presented to the engineer of ventilation than the correct and entirely satisfactory heating and ventilation of a crowded school-room.

In the first place, the active and rapidly developing brains of the occupants are peculiarly sensitive to the benumbing influence of close and poisoned air ; and secondly, as the pupils are confined peremptorily to fixed seats, they have not the liberty to change from one part of the room to another to avoid an unpleasant draught, or to get into a cool, refreshing breeze as a relief from the poisoned air of a foul and stagnant school-room.

It becomes an absolute necessity, therefore, that all portions of the room should be evenly warmed ; while at the same time great care must be taken to avoid currents of air either hot or cold.

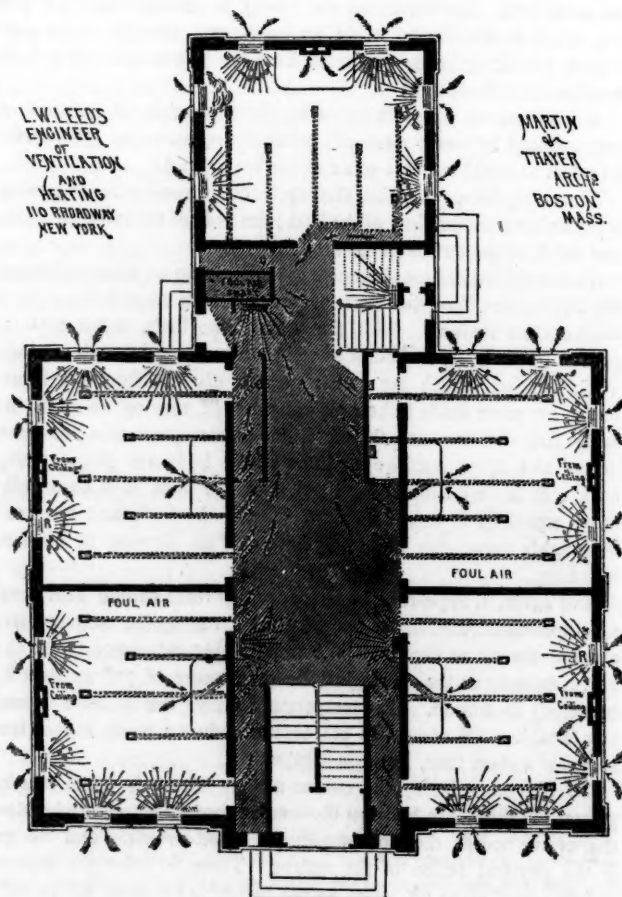
These requirements point directly to the necessity, for as great a distribution as possible, first, of the heat ; second, of the inlets of fresh air ; and third, of the outlets of the foul air.

The physiological requirements are : first, that we should always keep the feet warmer than the head ; second, that we should keep the back warmer than the face. With the student, the brain is the most active portion of the body, and consequently attracts the greatest flow of blood ; while the feet, which are at the greatest distance from the heart and lungs, are more liable to become chilled. In moving about we necessarily face the current ; therefore, for greater protection the principal nerves and more sensitive portions of the body are placed along the back. It is very debilitating to sit with the back to a cold wall, and more especially to a cold window. But if the back and feet are kept thoroughly warm, one can safely have cold air blowing in his face for breathing.

And again, it appears to be necessary that there should be a considerable difference between the temperature of our bodies and the temperature of the air we breathe. We require that difference to be at least 28° . As soon as the air reaches the temperature of 70° we want it kept constantly in motion. Any temperature above that is more or less uncomfortable. Of course we are able to endure a much higher temperature for a short time, but it is debilitating.

On the other hand, the colder the air is, or, in other words, the greater the difference between the temperature of the air we breathe and that of our bodies, the more rapidly the blood circulates and the greater is the physical action of the system. There is twice the quantity of carbonic acid given off when we are breathing air from 10° to 20° than when the air is from 80° to 90° . Every one knows how much more he can do on a clear, bright day in winter, than on a hot, sultry day of summer. Our great aim should be to produce, so far as need be, these most favorable conditions in our school-houses.

To recapitulate: The room should be warmed and ventilated in all parts alike; there should be no perceptible current in any part; the feet of the occupants should be kept warmer than their heads; their backs should be warmer than their faces; and, finally, their bodies should be kept warm, while they have cool invigorating air for breathing.



Now to produce these results, I can scarcely see how we can avoid coming directly to the conclusion that we should warm the floor and exterior walls to a temperature equal to that of our bodies, 98° , so as to

prevent the absorption of the radiant heat from our bodies by the walls. We could then afford to have cool air for breathing, say air at a temperature of 50° . The sun's rays heat much hotter than this even in winter. I have placed a thermometer in a box, protected from draughts and covered with a glass, in a snow-bank, in the direct rays of the sun. It soon rose to 182° , and I believe that carefully conducted experiments have shown that the direct radiation from the sun is sufficient to boil water, even in winter.

It is the important fact that the rays of heat from a hot body pass through pure air without heating it, which makes direct radiation so essentially different from heating by currents of warmed air.

In a room heated by warm air, all the air must be hotter than is required for breathing. It is very commonly heated upwards of 100° ; the solid objects in the room are much colder, and consequently are constantly absorbing the vital heat from the bodies of the occupants, while they are breathing this warm, debilitating air. It is this condition of things that gives that uncomfortable feeling so universally complained of in all rooms warmed by hot air.

On the other hand, it is the powerful direct radiation that comes from the glowing flames of an open fire, often at a temperature of near 3000° , that makes it so nearly correspond with the radiation from the sun, and enables it to produce an artificial warmth unequalled for comfort and healthfulness.

The requirements of the school-room, however, almost entirely forbid the use of open fires, owing to the impossibility of maintaining a uniform temperature over the whole room, and certain other minor difficulties. We must, therefore, accept some inferior arrangement for that purpose.

The accompanying diagram is intended to illustrate an arrangement made for a new school-house in course of erection at Salem, Massachusetts. Although the conditions above specified are not fully carried out in it, yet it is a step very considerably in advance of the ordinary arrangements found in our school-houses.

It is designed to heat the whole building by low-pressure steam from a boiler in the cellar, and to place the steam radiators under each window in all the occupied rooms.

Of course this will not necessarily warm the whole interior wall, as it would be very desirable to do; yet by placing a radiator under each window, a very considerable diffusion of the heat is obtained. Besides, the greatest heat is thus placed immediately below the greatest cold, so that the extremes will modify each other, and at the same time the injurious effects of sitting with the back toward a cold window is very much overcome. I fear few persons really comprehend the sad results of sitting with their backs to a cold window. If the matter is

carefully examined, it will probably be found that many weak and crooked spines, as well as many other weaknesses and debilities, are to be attributed to this cause. A clear comprehension of the effects of radiant heat is necessary to a full understanding of this subject.

If a piece of warm ice, say at a temperature of 31° , be placed near a piece of colder ice, say at 15° below zero, the warm ice will radiate its heat toward the cold ice, and will go on giving away its heat until it has made an equal distribution with its neighbor. And we must remember that a current of heated air flowing upward between these two pieces of ice would have but little effect upon the transmission of the radiant heat.

Now suppose the human body, with its temperature of 98° , be placed near a cold window or wall, the radiation of heat would be much more rapid than it would be from the warm ice, and not being returned or compensated for, the heat, the vitality, the very essence of life would be rapidly extracted from the body. And we must not commit the fatal error of supposing that a thermometer will correctly indicate the true condition of things. While a person may be surrounded by and inhaling a most debilitating atmosphere of 75° or 80° , this does not prevent the loss of heat by radiation; it rather aggravates the evil by reducing the circulation of the blood, thus lessening the amount of natural heat produced.

The distribution of the inlets of fresh air and outlets of foul air is of not less importance. Fresh air should be so thoroughly diffused that while there could be no possibility of stagnation, there would be no considerable currents perceptible anywhere. The diffusion of fresh air is quite well provided for by the introduction of air directly under every window and over the radiators.

The manner in which I arrange this is to place the marble slab covering the radiator from two to four inches above the bottom of the sash. Then by simply raising the window the fresh air flows in at the top of the radiator. Its specific gravity being greater than that of the air within, it falls over the face of the radiator, insuring about as perfect a diffusion of pure air as it is possible to have.

The proper place for the exit of the foul air has been much discussed. A few years ago no one thought of anything but taking it from the top of the room; then as soon as it was attempted to warm the room by circulating warmed air, the ventilators had to be closed. Now, the tendency is to run to the other extreme, and to have the only opening at the bottom of the room. This also is wrong, as the excess of the foul air is at the top probably three-fourths of the year. As great a distribution of outlets as possible is therefore important. I think the agitation of the air is the great means designed to maintain its purity. In the

Salem school have been provided, as may be seen, five registers for the escape of foul air from each class-room. These will be equal to an opening of one square foot each, or about one square foot for every ten children. Of course this arrangement is not perfect, but it will answer its purpose tolerably well. The space between the joists, under the class-rooms, is used for foul-air ducts. The ceiling of the hall is furred down from fourteen to twelve feet, leaving a space of two feet for a general foul-air duct, to convey the air to the main upright shaft. Great care is required in the proper proportioning of these air-ducts and in separating them one from another so that they shall all draw evenly, and the foul air not be blown from one room to another. Failures have occurred in attempting to ventilate through the floors in this manner, for want of proper care in this respect. Some power is always required to move the air, as it will no more move itself than water or coal. The variation in the external temperature is the great natural moving-cause. Our buildings obstruct this to a great extent. Artificial heat in the building causes a circulation, but there should be in every good school-house, besides these varying natural forces, a constant positive power always in operation. I think we have nothing at present more simple and efficient than the application of heat to a well-constructed shaft. The smoke-pipe from the boiler or furnace fires generally gives sufficient heat in the shaft during very cold weather, and a good stove or furnace is the best for procuring the required additional temperature during the warmer weather. Ambitious young engineers of ventilation are very apt to adopt the Fan, as that gives a fine opportunity for the display of their engineering abilities. It generally proves, however, very unsatisfactory in result.

The perfection of arrangements for providing artificial warmth has, for many centuries, been a good criterion of a nation's advancement in civilization; but I think a new era is dawning, in which a nation's ability to keep warm, and at the same time supplied with pure air, will be a much more accurate test of its elevation above barbarism. And I hope that our American Schools will be as prompt in taking the advance in this, as they have been in the many other improvements that have given them their enviable reputation throughout the world.

THE gifts to American Literary Institutions during the last five years, according to the *Congregational Quarterly*, reach the large sum of \$15,212,500. This amount is the result of individual benevolence, and does not include the appropriations by State Legislatures. The amount is distributed as follows:—Colleges, \$8,858,000; Theological Seminaries, \$1,359,500; Academies, \$1,850,000; Societies, \$540,000; Education, \$2,220,000; Schools, \$385,000.

JANUARY, 1869.

THE YEAR.

EIGHTEEN hundred sixty-eight has been a notable year in education, as in science and politics and nature—though differently.

Some of the grandest fetches of modern science have been made during the past twelve months. Some of the deepest mysteries of the universe have been solved, to the marvellous extension of human ken. The restless heart of Earth has throbbed the downfall of cities and the uplifting of continents. The restless heart of man, struggling with the restraints of centuries, has overthrown systems and governments, lifting nations, let us hope, to a higher plane, and preparing the way for better things to come. Human society is in a ferment, and the leaven of society has not escaped the changes which it has helped to produce. Yet the changes in the condition and prospects of Education, which the year has brought about, the world over, have been germinal rather than fruitful. There have been no brilliant achievements or great catastrophes; but the germs of great things have been securely planted. Those who can see the fruit-bearing tree in the tender blade or the sprouting seed, and those only, will duly appreciate the magnitude of the educational reforms which the past year has seen quietly begun—or, rather, the magnitude of the results which they are destined to produce.

WITHIN the twelvemonth, Constitutional provisions have been made in nearly all the Southern States for the establishment of free public schools. Popular opinion has been greatly improved in regard to the education of the laboring classes. And in many places the work has been successfully begun. We must patiently await the result. The education of a people is not the work of a year.

At the North, the most promising event has been, we think, the opening of our new University at Ithaca. Education, till now, has tended largely to divorce mind from labor. That is, practically. In theory the schools have pretended to prepare the rising generation to do the nation's work better than their fathers had done it. In effect, they have chiefly fostered the idea that the great object of Education is to enable the possessor to live without soiling his hands. They have failed therefore to act as they should, directly upon the class which does the nation's heavy work—the great body of producers.

Reasonably, or not, the instruction given in the elementary schools is determined by what is required by the college. Heretofore, these higher institutions have trained young men chiefly for the so-called learned professions. Possibly but one in a hundred of the pupils of the elementary schools is fitted by nature or permitted by circumstances to enter a college. Yet the course of study pursued in the schools has been shaped to meet the possible wants of the possible one—to the disregard of the real wants, to say nothing of the rights of the ninety-and-nine.

Cornell University will change all this. As a great polytechnic *labor* school, it will, in time, train men for every department of human industry. It will inspire a different ambition, and require a more multifarious preparation, than colleges of the classic sort. It will also dignify labor; and grade the laborer, not according to the material he works on, but by the intelligence with which he works. The public schools will have to supply its demands, while it, in turn, will help to supply the higher demands of the schools. The result can scarcely fail to be the broadening of the schools. They will have to develop and train *all* the faculties of the pupil—not merely his eyes to distinguish the varying shapes of words, and his memory to hold them fast. The needs of the ninety-and-nine will have to be regarded equally with those of the one. Education will thus be brought to a proper basis—the development and culture of the whole man to better fit him to do the world's work. And men, trained to work, will honor the workman. If this does not solve the "labor question," it will surely go very far toward doing it.

THE endowment of schools and colleges continues to be our favorite means of gratifying public and private generosity. In this respect

America presents a striking contrast with other countries. With us, education commands money and land. As a people, we are not less than prodigal in our expenditures for schools. And private benefactions thereto are equally lavish. We think little of granting to a college, from the public lands, a territory equal to a German principality. A private gift of a hundred thousand dollars is nothing uncommon ; and we are not surprised at one of a million.

In Europe they give less money, but more thought. In England, for example, public instruction engages the attention of the best minds of the land. The philosophy of education receives the ripest thought of her ripest philosophers. The same may be said of France and Prussia—in short, of the better part of the continent. Money is more plentiful than thought with us. So we give money. Indeed, we are passing through a sort of epidemic of educational endowment ; for which let us not forget to give thanks : the fruit will ripen by and by. Yet we must not think that money is the principal thing. Without thought—and thought of the highest order—much money may be spent for education without doing education much good. There is danger of our deceiving ourselves. As a people, we are apt to rate our zeal for any cause by the taxes we pay for it, or the voluntary contributions which we make for its promotion. But there are some things more powerful than money, which money cannot buy. Personally we admire, and hope that many will emulate, the munificence of our Cornells and Vassars, our Peabodys and Dews. Yet we would not have it thought that everything needful is done for education, because money is freely given for it ; or that education is the one thing nearest the American heart because of the generosity of the few. The actual fact is, that education holds a very subordinate position in the working affections of our people. Business, politics, pleasure, greed of gain, social position, personal ease, the gratification of appetite—many things, indeed, take precedence of education. With all our pretensions, we are thinking less—really doing less—for the higher culture of ourselves and our neighbors, than are many peoples whom, with serene self-satisfaction, we look down upon as ignorant and slow. Compare Vermont with Scotland, Connecticut with Switzerland, or Massachusetts with Prussia.

THE revolutions of South America retard, but they cannot wholly prevent the advancement of education. Several of the States are striving to imitate their more favored neighbors at the North, with as much success as the wretched condition of South American society gives reason to hope for. Brazil is studying the school systems of the world and the peculiar needs of her own people, with a view to the establishment of a system of public education. The Argentine Republic has lately chosen as her chief officer the man who, perhaps more than any other, has labored for education in South America. And the leading minds of all those unhappy States are casting about to discover what may be done for the elevation of the people. Many years must elapse before their efforts will be crowned with success; yet it is encouraging to know that the germs of popular education are there and living.

In the Old World, England has failed to fulfil the promises she made a year ago. Educational reform, raised as a party-cry, seemed to be a party necessity. Both parties, however, took it up, and after striving for a time to excel each other in vehement shouting, both let it drop, to the disappointment of many. Yet the agitation effected good. Many grievances were exposed, and public attention was called to the crying need of a better and more efficient system of public education.

Germany continues to lead the world, not only in the *wissenschaftliche Geist*, but in the spirit which educates each and every one of her children. France, from the plane of *la grande culture*, is working down through technical and normal schools, to reach in time every strata of society. Austria has freed her schools from the domination of the Church. And so has Spain. On the other side, Russian tyranny still bears heavily on the schools of her conquered nationalities; and England emulates the example in Ireland. With the overthrow of the Irish Church establishment will come, we trust, a more impartial treatment of Irish schools.

A new era is dawning in Turkey. Overlooking the Bosphorus, a great school has been begun, wherein Mussulman and Christian, Jew and Gentile, the youth of all the nations and creeds of that strange agglomeration of peoples and religions, lay aside national and religious prejudices to sit at the feet of the "Infidel," to receive the teachings of Western civilization.

Even the far-off Orient has caught the infection. China and Japan vie with each other in casting aside the traditions of centuries, to reap the advantages of Western learning. And not only have they opened their gates to European science and mechanic arts, but they have humbled themselves to invite the "outside barbarians" to come and be their teachers.

THE gains of Education, the world over, have been great. So, too, have been the losses. Death has been unusually busy in the ranks of Educators. Our Necrology for the year includes the names of fully fifty Americans known as prominent teachers and promoters of Education—*eight* of whom were College Presidents. The list of foreign dead is likewise great. More than a score of educators, whose fame extended to this country, or indeed was world-wide, are numbered with those whom we shall know on earth no more.

THE MONTH.

PERHAPS no educational question commands to-day more serious thought than the relation of our public schools to religious instruction. One can scarcely open a school-report or a religious paper without finding some more or less ambitious discussion of the subject, or more or less elaborate indictment of the schools for being "godless," "infidel," "nurseries of intellectual arrogance," and so on. Whether these accusations are well founded, is under discussion. We give the subject the first place in our new volume.

Our personal opinion has been, that the public schools, in a country split up as ours is into innumerable sects, should teach nothing liable to offend the conscience of any. To avoid giving offence, religious instruction would have to be ruled out entirely. But to exclude religious instruction, it seems, is to offend more or less all parties. On every side a change is demanded. We are not so fully persuaded of the perfection of our public-school system as to object to its being altered, or entirely remodelled, if the change is shown to be just and necessary. But before

it is done, or attempted, we should like to see proof that the children trained in church schools, in the "religious atmosphere," make better men and women than the pupils of our public schools. The question must be settled, not on the basis of sentiment, but on that of fact.

WHILE speaking of ourselves it may not be inappropriate to give the reader a hint or two of our plans and purposes for the current volume.

A subject of vital importance to millions of school children and their teachers, is the ventilation and warming of our school-houses. From the costly devices that are being tried for securing warmth and pure air to children in school, it would seem that the great body of tax-payers are also concerned. The article in our present number is intended to be the initial one of a series, in which will be considered the more important plans that have been adopted for the heating and warming of school-houses, with a critical review of the excellences and defects of each.

THERE is a sort of rhythm in the advance of science. Sometimes the emphasis of achievement falls on one department, sometimes on another. For one period Geology astonishes the world with its revelations; for another, chemistry; and then, in turn, some other branch excels. Just now Astronomy leads the way. In view of this, we shall give, from month to month, especial attention to the more recent problems and discoveries in this attractive field. The article entitled "Easy Star Studies" will be found of service to those who have not time or opportunity or patience to study the intricacies of celestial globes and maps, and who yet desire to gain a sight-acquaintance with the heavenly bodies, among which astronomers are making such brilliant discoveries. It is intended to mount the Pocket Planisphere on suitable card-board, for the use of students.

We wish it were possible to impress upon teachers, *all* teachers, the interest they ought to feel in educational journals. Not because we are personally interested in the prosperity of these publications, but for the good of the teachers themselves. There is no better index of the professional spirit and zeal and efficiency of the teachers of any State, than the character of their State journal of education, and the support they

give it. Our circulation reaches every part of the country, and nowhere is it better than where there is a good and well-sustained teachers' paper or magazine. A calling which scatters its laborers as teaching does, cannot hold them together by social ties. There is no way of keeping up among teachers a proper professional spirit, the next strongest bond, except by means of the press. More than the members of any other profession, therefore, teachers need professional papers to keep them awake and in earnest, and in full sympathy with their fellow-laborers. To every teacher in the country we would say: Subscribe for, pay for, and read an educational paper—THE MONTHLY, if you please, your own State Journal *any way*. If you think it not good enough, help to make it better. It is because of your neglect that it is not better. It is safe to say that it is worthy of all the support you have ever given it, and more.

In our next number, or soon after, we shall review the work done by the State and local school-journals during the past year.

We shall also publish soon two series of articles on illustrative experiments in Natural Philosophy and Chemistry. So far as possible, the experiments will be such as can be made by the use of simple contrivances, easily prepared or obtained by any teacher; and, for the most part, they will be such as are not to be found in ordinary text-books.

THE publication of our customary Necrology of Eminent Educators will be begun in the next number, or as soon after as the lists can be fully made up. As has already been said, the losses by death the past year were very heavy—heavier even than in 1867, a year of unusual depletion of the ranks of teachers and promoters of education.

Owing to the length of our leading article—to which, we are sure, none of our readers will object—we have been obliged to confine our chapter of "Educational Intelligence" to a brief survey of the schools of Vermont. To such as are not familiar with our custom, it may be said that instead of giving in this department, newspaper fashion, detached items of educational news, our plan is to review comprehensively the condition and prospects of education in particular States and countries: in this way we shall survey in the course of the year, the States and larger cities of our own country, and the principal foreign countries. Educational events deserving immediate notice will be discussed under "The Month."

EDUCATIONAL INTELLIGENCE.

VERMONT.—“An investigation, that has been made with care, shows that during the last collegiate year only one hundred and sixty or seventy young men of our State were members of any college or scientific school.”

Such are the words of the Governor of the Green Mountain State, in his late message to the State Legislature. The cause of this disesteem of education by the young men of Vermont naturally proceeds from the inferior character of the district schools; and the condition of these schools is charged by the Secretary of the State Board of Education to “the general indifference of parents.” The Report of that officer for the year ending September last, presents as melancholy an array of school statistics as can be shown by any Northern State outside of New England. Perhaps New Hampshire, or Maine, or Connecticut, might rival its unenviable record; but we are happy to believe that no other State, north of the now obsolete Mason and Dixon’s Line, can. About a seventh part of the State, that is, thirty-two towns, cared so little for the schools that no statistical returns were made from them. “The presumption is,” says the Secretary of the State Board, “that there were no superintendents, or that they failed to perform any of the duties of the office.” The number of families, in the towns reported, is 54,277, with 75,599 children between four and eighteen years of age. For these there were 2,620 district schools, employing 4,224 teachers. The average attendance was a little short of 50,000; the total enrolment, less than 60,000. There were besides 349 “select schools,” which increased the number of school-going children to 66,405. The number over eighteen years of age attending school, was a little short of 3,000. The average daily attendance in all the schools is not given. As 532,460 cases of tardiness were reported, and 78,560 of “dismissal,” it may be presumed that the number in regular attendance was not very large. Less than 9,000 are reported as having no absences,—for what length of time is not stated. That the school terms were short, is evident. The amount paid as salaries to the 4,224 teachers employed, was \$200,693, exclusive of board, that is an average of less than \$50 to each. In addition to this, \$126,714 were paid for board of teachers, or an average of thirty dollars for each teacher. The cost of the living of 1,298 teachers, who “boarded around,” is probably not included in the “sum paid.” Putting all together, it appears that the teachers of Vermont are paid on an average about *one hundred dollars a year!* Certainly not enough to warrant any extensive emigration of teachers to that pleasant region. The condition of the school-houses and their appurtenances does not show to any better advantage than the condition of the schools. Nearly one-third of the school-houses, 808, are reported as unfit for their purpose; and only 234 with yards inclosed. In the 2620 public schools, there are 113 dictionaries, not quite an average of one to 23 schools; 205 globes, 355 maps, and 144 clocks. The blackboards come very near equalling the schools in number, that is 2,134, size not mentioned. With such a plentiful lack of aid and comfort, it is not surprising that the teachers do not stay long in a place. Of the 4,224 teachers employed, only 757 are

reported as having taught before in the same district; 1416 had *never* taught before; the remaining 2061 were strangers in the land. Their next move, one would think, would be *out* of the employment; unless they are of that unhappy class, who, according to the out-spoken Secretary, "remain permanently in the profession" because they "have too little ability to insure success, and too little enterprise to risk a failure, in those professions where success insures a more remunerative reward, and where there is a higher order of talent to compete with."

But we do not despair of the State. The sky is brightening. The Legislature took this matter in hand at its last session, and with characteristic liberality decreed that "the time, *not to exceed two days*, actually spent by any teacher of a public school in attendance upon a teachers' institute held pursuant to law during the time for which such teacher is engaged to teach such school, shall be considered as time lawfully expended by such teacher in the service of the district by which he is employed, and in the legitimate performance of his contract as teacher!"

CURRENT PUBLICATIONS.

"GET the latest; get the best." This has been ringing in our ears almost incessantly while we have been looking over the pages of one of the most refreshing of books, the most recently published English Grammar that has come to our notice—Vickroy's.¹ "In the grammars in use," the author says, "the errors of former ages are repeated." In this work, comparatively few of those errors are found. The errors that do appear are mainly original—those of the present age and of the present author. Mr. Vickroy assures us that he "has made free use of other systems," yet he has generally done his own thinking in his own way, and the result is, he has brought out a new system—a somewhat peculiar system, it is true; still, it has the merit of originality. The principles embodied in his little book (and it is little in more senses than one), he says, "have been developed and tested in the recitation-room, and have been adopted only after careful consideration." Let us hope, therefore, that they will bear to be tested outside of the recitation-room.

We gird ourselves for the task, and proceed to notice a few of the excellences of this latest candidate for "orders."

The first is its complete system of classification. This is the prominent feature of the book. Indeed it crops out on every page. It makes us feel that the author should have devoted his wonderfully analytical powers to the higher mathematics rather than to the elements of grammar. Those, however, who are in search of a skeleton-like embodiment of grammatical facts and fancies, who go on the principle that "the nearer the bone, the sweeter the meat," will find this book just to

¹ The Principles of English Grammar, by T. R. VICKROY, A. M. Philadelphia: J. A. Bancroft & Co., 1868. 12mo, pp. 214.

their taste. They may possibly object to the scarcity of the meat. But we assure them that what little there is, is all the sweeter on account of the numberless bones from which it must be picked. After a thorough overhauling of these bones, or (to drop the figure) after a careful examination of the book, we find that the multitudinous classes and subclasses into which the author has so studiously divided and subdivided the subject may, in the main, be rearranged, from an esthetical point of view, into the following classes. 1. The just and necessary. (This, by the way, is a comparatively small class; and, showing as it does where "the author has made free use of other systems," it can scarcely be considered an excellence of this book in distinction from other books.) 2. The fanciful. 3. The false. 4. The useless. 5. The defective. 6. The redundant. 7. The inconsistent. These are so felicitously intermingled with each other that we can scarcely give examples of one without giving examples of others at the same time. We shall have to satisfy ourselves and our readers, therefore, with illustrating the correctness of our classification of the author's classifications, not singly, but in the mass. We premise, however, for the benefit of those who have not seen the book, that we may quote therefrom several new words whose meaning they may be at a loss for, if they are merely English scholars. But, in order to make everything clear, all they will need to do will be to spend a few years in studying Greek and Latin.

Under the head of what the author calls "Parts of Speech" (some would have said *The Parts of Speech*), words are divided first into three classes: "I. Ideatives. II. Connectives. III. Particles." These are then subdivided so as to make in all just thirteen parts of speech—a good, old-fashioned, round count, somewhat obsolete nowadays. Some of this work of classification may be deemed useless. But we assure our readers that "useless" is not just the term to apply to generalizations the object of which is "to present the subject in a clear light." For instance, among the Ideatives the author places Pronouns and Adverbs; then among the Connectives he gives *Conjunctive Pronouns* and *Conjunctive Adverbs* as distinct parts of speech. Among the Connectives he classes *Conjunctions*; then among the Particles are found *Correlatives*, as another part of speech, of which the only example given is, "*Though* he was rich, *yet* he became poor." Turning to page 89, we find *though* given also as a "Conditional Subordinate *Conjunction*," and yet as a "Correlative Concessive Subordinate *Conjunction*." We admire the simplicity of such generalizations, and doubt not that most of our readers will also. There may be some, however, to whom it may seem as though the author had got his classes somewhat mixed. But they should remember that, to have a thing thoroughly impressed on the mind, it needs to be repeated again and again.

Personal Pronouns are, for obvious reasons, divided (p. 38) into "(a.) Simple. (b.) Compound. (c.) Adjectival." The "Adjectival Personal Pronouns" are the forms *mine, thine, hers, ours, yours, etc.*, which are never used adjectively, and therefore very appropriately called "Adjectival." For this reason, doubtless, the author, in prosecuting his new system of generalization, a little further on (p. 45) varies this name slightly, and calls them "Adjectival Pronominal Adjectives." This, however, is only a subdivision of Definitives, one of the three grand divisions into which all adjectives, after due process of developing and test-

ing, have been thrown by our analytical author. In full, therefore, the new baptismal name of the possessive forms *ours*, *yours*, etc., is either "Adjectival Personal Pronouns," or "Adjectival Pronominal Adjectival Definitive Adjectives," which reminds us of the classic name of a fair colored girl, whose poetically disposed parents called her Martha Ann Amelia Ann Nancy Cunningham.

Verbs, our author divides into—I. Infinite, and II. Finite. This certainly is clear, definite, and all-embracing. An Infinite Verb, however, consists of "*The Infinitives, The Participles, and The Imperatives.*" And Imperatives belong to an "Infinite" verb clearly because "they are without limitation and agreement with a subject. This "has been developed and tested," thus :

" Singular.

1st Person.—Let me love.

2d Person.—Love.

3d Person.—Let him love.

Plural.

Let us love.

Love.

Let them love."

You don't *see* any subjects here, do you, reader? Neither does Mr. Vickroy, A. M. He sees, however, two numbers and three persons. We hope, dear reader, you understand what grammatical infinity is. Don't think there is anything crude, or queer, or contradictory in these generalizations. They are in perfect accordance with the principles of the entire system—a system which, according to Mr. V., "accords with the present state of Philology and Mental Science, and which has been adopted only after careful consideration."

Verbs are moreover divided "according to their syntactic uses into two classes" with sweet little names, "viz., (1.) Attributive Verbs, and (2.) Complementative Verbs." No doubt they feel complimented thereby. Of Attributive Verbs "there are four kinds: (a.) Intransitive. (b.) Copulative. (c.) Inceptive. (d.) Indefinite Transitive." As a specimen of Inceptive Verbs the author gives, "The fields *look* green;" because *look* "asserts the incipency of an act." Of course, in the "testing" of this in Mr. V.'s recitation-room, it was evident both where the "act" and where the "incipency" of it comes in. If any of our readers have doubts on this point, we must inform them that the allusion is to the spring of the year, when fields generally "look," *i. e.*, "begin to do" verdant. Of Complementative Verbs our little book tells us, in terms charmingly euphonious and marvellously transparent, especially to little folks, "there are four kinds: (a.) Definite Transitive. (b.) Transito-Dative. [A misprint, probably, for *Transito-Definite*.] (c.) Transito-Copulative. (d.) Transito-Partitive." We turn to the preface and find that "the author has introduced new terms *only where his generalizations have required them.*" The thought is refreshing! *Only* there!

Let us a moment look at some of these new terms—nice little philological stones for boys and girls to run their little intellectual foreheads against in striving to scale the heights and sound the depths of this charming science—bewitchingly charming, as most youths will testify. On the very threshold of the work, instead of the "Etymology" of the grammars in use, the reader will find "Morphepology," which, of course, he will get over without stumbling. It looks suspicious, it is

true, to see a big bully of a word like this, standing right at the entrance of the seemingly Elysian fields just before you. But don't be afraid; young friends. Like Bunyan's lions, it is chained. It can't bite. Once pass it, and all is easy. The words and expressions that follow, though many of them are rare, are all delectably sweet, in no danger whatever of breaking your jaws, exceedingly easy of digestion withal. Try a few, and see. They are perfect sugar-plums. Samples free:—Hermeneutics, Ideatives, Continuants, Coalescents, Categorical, Articulatory Organs, Conjunctive Adverbs of greater or lesser inequality, the Essentia and Differentia of sentences, Quantitative Complements, Modal Propositions whose predicates express excogitation.

But we pass on. Another excellence of this work is its clear and logical definitions. Take, as a fair sample, the first definition of the book:—"Language is the *embodiment* of a mental act in articulate sounds or words." What can be more logical? Because speaking or writing is the embodiment of ideas in words, and in speaking or writing we use language, therefore language is the embodiment of mental acts in words. Why, the logic of lunatic-asylums can scarcely beat that! A noun is lucidly and concisely defined as "a word which *expresses* the whole or a distinct part of a thing." Take the sentence, "Of all the months in the year, seven have thirty-one days each." Here each of the words *all* and *thirty-one*, "expresses the whole;" while *seven*, and *each*, respectively "express a distinct part of a thing." These words, therefore, though vulgarly called adjectives, when properly "tested," prove to be nouns. Here is an exceedingly lucid and striking definition: "A Compound Personal Pronoun is a pronoun which shows the relation of an object to the speaker; as, *James hurt himself*." This is as clear as an autumnal fog off the coast of Newfoundland. The subject of a sentence is said to be "*that* of which something is affirmed;" as when we say, "John writes," not the word *John*, but the person denoted by that word is the subject of the sentence. And the author really means this; for on page 109 he says, "The subject of an imperative sentence is the *object addressed*." And according to his definition, a sentence is "a mental act;" and the subject of a mental act is, of course, some object of thought, something conceived of by the mind. We cannot too highly commend the logical correctness of these definitions, even though we ourselves hold that a sentence is a *combination of words* expressing a mental act, and consequently that the subject of a sentence is a word, or a combination of words, representing that of which something is affirmed.

There are quite a number of definitions and remarks which, notwithstanding their original excellences, show that the author has made rather too "free use of other systems," so that we fear he has been betrayed into at least one of "the errors of former ages," the confounding of thoughts and things with the words employed in regard to them. Here is an example or two. "A transito-partitive verb is one that asserts an activity which affects only a part of its complement; as, *He drank* (of the) *water*." The "complement" of *drank* here, of course, is the word *water*; and *drank* is a transito-partitive verb, because it "affects only a part of" the word *water*. It must be so, for the author says it "has been tested," and we have no desire to question his word. Again, p. 127, "If two or more *objects* possess a thing conjointly, the sign ('s, s' or ') is suffixed to the *latter* only;" which occurs, we presume, on the first of April. The

reader's attention is especially called to *s'* as being a new sign of the possessive, not mentioned in "the grammars in use." This is one of the developments of the aforementioned recitation-room, "thoroughly tested" of course.

Mr. V.'s "Rules of Syntax" are models of the kind. They are generally clear and well-expressed, and are all professedly "rules without exceptions." As a sample of clearness and exactness of expression, take Rule III. "*The pronoun must be in the same person, number, and gender as the object which it represents.*" Mr. V., like the framers of most grammars in use, inadvertently makes person, number, and gender "properties of nouns and pronouns." But this, of course, is not his meaning. If the word *he* stands for Mr. Jones, it is in the 3d pers., sing., and of the masc. gender, because the man Jones is a *tertium quid*, hence of the 3d person; an "odd-fellow," hence in the singular; and of the genus *homo*, hence of the masculine gender. Rule IV. illustrates, as well as any, the fact that Mr. V.'s Rules are "without exceptions." "A noun or pronoun predicated of a noun or pronoun, must be in the same gender, number, and case;" as, "Mr. Jones is a brick;" "His speeches are an honor to the country;" "Eyes was I to the blind." That is, if we understand the rule, the word *brick* is masculine because the noun Jones is; *honor* is plural because *speeches* is; and *eyes* is singular because *I* is. We say "if we understand the rule," for how a "noun" or a "pronoun" can be "predicated" of a noun or a pronoun, we don't quite see yet. Generally, the things predicated are certain acts or states, and they are predicated of objects. Possibly, by a figure the noun *brick* can be predicated of the noun Jones. But, we fear, not without considerable dust. At all events, most students would have to figure a long time to prove *brick* to be masculine, *honor* plural, or *eyes* singular, in the above examples.

But the book is so thickly set with gems of rare excellence, that we are really lost among them. We have not room even to allude to the hundredth part of them. But we must not close without calling our readers' attention to one more point; namely, certain choice examples of false syntax. We leave this for the last, on the principle that we take our dessert, the sweetest and choicest portion of our dinner, not before but after we have picked our turkey's bones. Among examples of false syntax, on pp. 121, 163, are these; "Mary is a poet;" "Julia is a teacher;" "She was considered a good teacher;" "Susan is a doctor;" "They elected her professor of mathematics." Does the reader wonder where the false syntax is? Why, you don't understand the new system, which our author "has developed and thoroughly tested." These examples should read, "Mary is a poetess;" "Julia is a teacheress;" "She is considered a good teachress;" "Susan is a doctress;" "They elected her professorine of mathematics." We fear our readers may think we are jesting. We are not. We were never more serious. In fact, our seriousness partakes of sadness; for we realize with the poet, that

- "Full many a flower is born to blush unseen,
And waste its sweetness on the desert air."

And we are apprehensive that these flowers of Mr. Vicroy's are born, if not "to blush," at least to waste their fragrance outside of most "recita-

tion-rooms." Mr. V. says, p. 121, "*poet* must be changed to *poetless*, to agree with *Mary*, according to Rule IV. A noun or pronoun, predicated of another noun or pronoun must be in the same number, gender and case."* But who will believe this? If our readers can turn to pp. 34, 35, they will find, however, that this should be as Mr. V. says. For, besides the foregoing feminine forms, they would there find such words as *oralress* and *oratrix*, *negress*, *foundress*, *tutress*, etc., etc. Mr. V. says, "I have inserted these words, *teacheress* or *teachress*, etc., as the terms which should, and will be used before many years." Sad as the thought is, we don't expect to live long enough to see them adopted. It is a consolation, however, to know that they "have been tested."

The first lack of teachers is a comprehension of their work. Normal schools have done much to increase their professional skill, but very little to impress upon them the scope and philosophy of teaching. Teachers' conventions and institutes fail to furnish the broader views which teachers lack; for the discussions to be heard at such meetings seldom transcend the limits of school-houses, text-books, and school committees. The available literature of education—the writings of our Randalls and Wickershams and Harts—is quite as narrow and unprofitable. The writings of masters whose opinions are worth heeding, are for the most part too expensive for the slender purses of teachers. Teachers have therefore been compelled to pursue their work unaided, or but little aided, by the labors of their predecessors: to learn in the costly school of experience, by practising on what they are called to develop and train.

An enterprise¹ which promises to improve this condition of things, by affording teachers, in moderate compass and at moderate cost, the materials for studying their duties in the reflections of great and practised minds upon the subject of education, will, we are sure, not only meet with the favor it deserves at the hands of teachers and friends of education, but prove a most efficient aid in raising the character and grade of our public schools. No name is more worthy to inaugurate such an enterprise than that of JOHN LOCKE, forever memorable in the domain of education, as well as of religion, philosophy, and politics.

Interwoven with the life of George Stephenson is the development of the Railway Locomotive. The man and the machine are inseparably connected in history. Although the Steam Locomotive is not the offspring of Stephenson's brain, yet he so identified himself with its first efforts, defended it so effectually against its detractors, insured by his skill its first successes, and, by eliminating its earlier faults, brought it to its perfect state, that, just as we feel we are indebted to James Watt for the perfect stationary Engine, so we place to the credit of the elder Stephenson the practicable Locomotive. It is interesting to note, how, emerging from the obscurity of a small English mining village, the growing fame of the hero is measured by the success of the machine he perfected.

* The punctuation of this is Mr. Vickroy's.

¹ A Library of Education: a Series of Educational Works, embracing the writings of Ascham, Milton, Locke, Prof. De Morgan, George Long, Herbert Spencer, Horace Mann, Montaigne, Fenelon, Rousseau, Pestalozzi, Richter, etc., etc. New York: J. W. Schermerhorn & Co. 32mo. Paper. 15 cents a volume. By mail, 20 cents.

Step by step from the position of "plugman," at twelve shilling a week, he rises through the grades of Engineman, Enginewright, and Railway Engineer to the head of the profession. His fame is achieved abroad while he is yet plain "Geordie" among his comrades, so that a letter directed to "George Stephenson, Esquire, Engineer," goes astray in his own village. From the lowest to the highest position he occupies—from that of shoe-mender and plugman at Killingworth, to that of guest and consulting engineer of the king of Belgium, his advancement is never by chance—every position is earned. The opposition his railway plans met with in Parliament, and his sturdy defence, form an interesting episode in the history of applied science. His triumph over the difficulties of Chat Moss, in spite of the predictions of professional engineers—his victory over the more subtle difficulty of human opposition, prompted by jealousy and backed by the press, are all skilfully set forth by Mr. Smiles,¹ and teach a lesson that will never lose its value till inventions cease. The career of Robert Stephenson is that of a man who had unusual advantages, and who availed himself of all that fell in his way. Without the philosophical mind of the father, he still possessed all those qualities which make a great engineer. The chief monuments to his memory are of his own building, and will long stand the pride of his country. The author has not always observed the chronological order, in detailing the chief events of the history, and yet we feel that the tale would suffer some loss if told in any other way. Mr. Smiles differs from most of his contemporaries in refraining from over-exalting his hero; and the reader will hardly fail to be convinced that George Stephenson was a great man, great even beyond the estimate of his biographer.

Messrs. Scribner & Co. have done a good thing in republishing Dalglish's *Manual of Analysis*.² It is an unpretending little book, but a very satisfactory one. It combines, in a wonderful manner, brevity with fulness of treatment. Its definitions are, for the most part, short, clear, and correct. Its exercises are not only progressive, but copious and well selected. Some of the author's analyses, to us, are new and pleasing. We commend the volume to those who are in want of a concise and thorough work on grammatical analysis.

Harper & Brothers: *CYCLOPEDIA OF BIBLICAL, THEOLOGICAL, AND ECCLESIASTICAL LITERATURE*. Vol. II., C. D. By MCCLINTOCK & STRONG.—*THE CIVIL WAR IN AMERICA*. Vol. II. By JOHN W. DRAPER.—*THE SPANISH CONQUEST IN AMERICA*. Vol. IV. By ARTHUR HELPS.—*SOHOOL LYRICS*, compiled by S. M. CAPRON.—*THE OPIUM HABIT*.

C. Scribner & Co.: *THE HUMAN INTELLECT*. By NOAH PORTER.—*KATHRINA, HER LIFE AND MINE* (illustrated). By J. G. HOLLAND.—*MORAL USES OF DARK THINGS*. By HORACE BUSHNELL.—*ADVENTURES IN SOUTH AND CENTRAL AMERICA*. By DON RAMON PAEZ.—*CONSTANCE AYLMER: a story of the 17th Century*. By H. F. P.

Leypoldt & Holt: *LANDMARKS OF ANCIENT HISTORY*. By Miss YONGE.—*LANDMARKS OF MEDIEVAL HISTORY*. Do.—*LANDMARKS OF MODERN HISTORY*. Do.—*OTTO'S BEGINNING GERMAN*. By L. FYLODET.—*GUIDE TO GERMAN CONVERSATION*. Do.—*BEGINNER'S FRENCH READER*. Do. J. C. GARRIGUES & Co., Phila.: *THE TEACHER'S GUIDE TO PALESTINE*. By H. P. K.—*PAUL AND MARGARET, the same*.—*GENEVA'S SHIELD: a story of the Swiss Reformation*. By REV. WM. M. BLACKBURN.
A. S. BARNES & Co.: *COMPLETE GERMAN GRAMMAR*. By JAMES H. WORMAN, A. M.

¹ The Life of George Stephenson and of his son Robert Stephenson; comprising also, a history of the invention and introduction of the Railway Locomotive. By SAMUEL SMILES. With portraits and numerous illustrations. New York: Harper & Brothers.

² Grammatical Analysis, with Progressive Exercises. By W. S. DALGLISH, M. A. New York: C. Scribner & Co., 1863, pp. 66.

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A CASE, A DECISION, AND SOME REFLECTIONS.

IN the *Iowa School Journal* for last June, p. 280, will be found a full account of the case described in the following extract :

"Mr. Austin Hays had a rule that when a scholar missed two words or more, he should be subjected to some punishment. The punishment differed in different cases, according to the disposition of the pupil. About the 16th of December last, a little boy of eleven, Joseph Elliott by name, missed two words. In this case the teacher made him toe a crack in the floor, and, reaching forward, touch the handle of the broom which lay on the desk before him. The broom was placed at such a distance that he could touch it with some effort. A book was then placed on the broom to keep it steady. The teacher then proceeded with his work. As soon as his back was turned, the boy ceased touching the broom, and stood upright. The teacher put him in position once or twice, but the boy acted as before. The teacher then sent for a rod. The rod brought in was a crab-apple limb of rather immoderate size. The teacher took it and told the boy that he would help him. He whipped him and left him in position. Soon the boy stood as before, and again the teacher applied the rod, and said if he had to whip him again, he would take off his coat. The boy did as before, and the teacher, with the assistance of one of the larger scholars, did take off his coat ; but he did not whip him. The boy then remained in position till the teacher told him to take his seat. Returning home, the boy reported what had occurred, whereupon the boy's father, Moses Elliott, had the teacher arraigned on a charge of assault and battery."

The justice of the peace who first heard the case, found the teacher guilty, and fined him \$1.00 and costs. On appeal to the District Court,

[Entered according to Act of Congress, in the year 1868, by J. W. Schermerhorn & Co., in the Clerk's Office of the District Court of the United States for the Southern District of New York.]
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after a favorable charge from Judge Sampson, the jury acquitted Mr. Hays; and it would appear, from the charge, that they were persuaded; 1st, that the boy had failed in his lesson wilfully, from neglect or idleness; and, 2d, that considering "the nature of the offence, the age, size, and apparent endurance of the pupil," the punishment was neither "excessive" nor "inhuman," but was both "reasonable and necessary," and permitted by law.

There could, it appears to me, be few better made-up cases for the opponents of corporal punishment than this, which was not made up, and which was even decided against them. The arbitrary character of the rule violated; the inquisitorial penalty—not to be called punishment but torture; the "crab-apple limb of rather immoderate size;" the moderate-sized "boy of eleven;" all these features of Mr. Austin Hays's discipline challenge an indictment of brute force in the school-room. On this phase of the question, however, it is not my present purpose to dwell, further than to say that if it could have been proved that the boy's father was in the habit of correcting him with crab-apple and other limbs, it would not have acquitted the teacher. It would not have convicted the father of malice, since there are many rights properly reserved to the family: such as religious instruction. But it would have served a good end in showing that the home and the school alike need reforming, and under what disadvantages the experiment of school-keeping without the rod labors and must for a long time labor. While the practice of moral suasion, however, reacts upon and educates the home, the discipline by violence not only confirms some parents in ways of harshness, but obstructs others in their attempts to govern by love.

The question of humanity and expediency is presented, and fully and fairly discussed, in the *Massachusetts Teacher* for July, in recording the State action of Massachusetts in regard to punishment in the schools; the most valuable portion being the testimony given by the Rev. S. J. May, of Syracuse, as to the results of abolishing corporal punishment in that city. But however much the worst and the ordinary cases in which the rod is used excite our feelings, and induce serious reflection, there will come a time, I am sure, when they will appeal rather to the sense of humor of those who consider them after they have become obsolete. Posterity will call them not "cruel" nor "barbarous"—being removed from all immediate sympathy with the victims—but "absurd" and "preposterous." The age in which they occurred, it will be said, had as imperfect notions of education as the Church, in the thirteenth century, had of religion. Ignorance, like heresy, must be extirpated by force; the argument for the rack was the argument for the rattan. The Pope and the schoolmaster alike looked only at results—a certain formula to be repeated, a certain spelling lesson to be learned; innocent if the task was

performed, guilty if "two words" were missed. Conscience, conviction, thinking and reasoning out the creed insisted on, the voluntary inclination of the soul toward truth—all went for nothing; obedience and conformity were alone required. So the free exercise of the intellect, the getting of knowledge for the sake of knowledge, the learning, not by rote and tradition, but by original discovery and understanding—were no concern of the teacher. To pass the examination of the *Consistorium* or the Committee was the indispensable requirement; and whoever, for want of light, or for want of willingness (which might only have been want of light also), failed of this, was to be helped through by *question ordinaire* or *question extraordinaire*. And the limit between ordinary and extraordinary punishments in either case was a purely arbitrary one.

How the serious earnest of one age will seem to another and succeeding age a sort of grim humor, appears from the way in which we regard the obsolete English law that permitted a man to beat his wife with a stick not stouter than his thumb. Judicious chastisement, to those early legislators, seemed a fit and necessary aid to conjugal affection and domestic tranquillity. Our lawgivers have made it the surest ground of divorce, the sufficient proof of incompatibility. The modern notion of love excludes that of violence as contradictory, and the tendency is to exclude also that of obedience. More and more generally, in this country, does the clergyman omit from the marriage ceremony the wife's promise to obey, and in other respects reduce the engagement to a perfectly reciprocal one. In the last resort, of course, obedience among reasoning beings of mature years and understanding, is secured only by the exercise of force, and public sentiment has decided that servility not merely dishonors love but kills it. But this, unhappily, is much in advance of private practice, and in most of the compromises of which married life consists, woman goes to the wall merely because she is a woman.

The reason why torturing the spine and shoulders of a growing boy, and then trouncing him with a crab-apple limb, can seem to anybody only moderate correction, and not a painful or even a grotesque spectacle, is because, on the one hand, there is absolutely no code to which the teacher is amenable for his severity, and, on the other, force has not yet been discarded as an inappropriate means of promoting education. It is true, teachers are sometimes punished by the courts for abuse of their scholars; but it is notorious that conviction depends in great measure upon local circumstances, and on the disposition of the judge. Should the latter be greatly attached to the traditions of his early training, the accused need stand in little dread of him. The pedagogue of the "good old times" has departed, but his birch-doctrine lingers in many minds which would be horrified at his actual resurrection. I should hope that no school at the present day would tolerate such a monster as Horace

Mann describes in one of his reports,¹ when speaking of the English schools. "I was standing one day," he says, "in conversation with an assistant teacher, in a school consisting of many hundred children, when, observing that he held in his hand a lash or cord of india-rubber, knotted toward the end, I asked him its use. Instead of answering my question in words, he turned round to a little girl sitting near by, perfectly quiet, with her arms, which were bare, folded before her and lying upon her desk, and struck such a blow upon one of them as raised a great red wale, or stripe, almost from elbow to wrist." I should hope, I repeat, that such wanton cruelty could find no shelter in any American community, though if I were a lawyer, I would as lief undertake to defend the case just cited as Mr. Austin Hays's. No inconsiderable part of the flogging practised on Southern plantations was due to the theory that to keep alive a wholesome terror, trivial offences must be magnified, or offences invented, or the lash applied without so much as a pretext that it was deserved.

The fiction that the teacher stands *in loco parentis* answered well enough for the time when a parent's duties were deemed fewer and simpler far than they are now, and there was a general agreement in regard to them. Presumption then was always in favor of the teacher and against the pupil—even in his own home—who had fallen under the teacher's displeasure. Imagine (what is a real case) the discipline in a family of perhaps more than usual affectionateness, where the grown-up girls could not wear short-sleeved or low-necked gowns because of the bruises and discolorations caused by repeated floggings; in which the dropping of a fork at table was punished as a falsehood was punished; in which, on principle determined by genuine love, the whip was the only mode of reproof and admonition. What an almost unlimited support the barbarism of the school-room would have from such parents, even when brought to their door in the person of their own offspring! And what was true of one family was probably true of the neighborhood. We have so far changed all that, that the presumption is the other way, because children are trained less by coarse and brutal instrumentalities, and more by patience and reason—more as equals than as subjects. If not a majority, certainly a large and increasing minority of parents have put away the rule of violence from the household; and these certainly have a right to say to their self-styled representatives: Observe our discipline with our children. Yet nothing is clearer than that distinctions in school government are impracticable and undesirable. Shall it be, then, the rod for all or the rod for none? Let this question be answered by another: Will any parent find fault with

¹ For 1843. Page 382 of Mrs. Mann's "Life and Works." Boston: Horace B. Fuller. 1868.

a teacher who governs without corporal punishment? If not, then you have only to secure a teacher who can so govern, and the problem is solved, for all parties will be satisfied.

Such, and such teachers only, will be sought after and accepted when once it is generally perceived that the proper object of instruction, in schools of all grades, is not to carry classes through a prescribed course, but something far higher. Given the *quantum* of geography, arithmetic, spelling, and grammar fixed—Heaven knows by what standards—for a district school, and any methodical teacher can divide the number of pages of the text-books by the number of days in the term, and with energy drive his pupils through the quotient, their daily stint. He may drive with the rod or he may drive without it, the District in either case looks complacently at the result and makes no odious comparisons. The thing which was to be done has been done; the school has maintained its reputation, the school committee's estimate of the powers of the youthful brain under pressure has been triumphantly vindicated; the medals, diplomas, and prizes have been duly awarded, and everything is for the best in the best of worlds. The result, in other words, being satisfactory, why quarrel with the means? Why inquire about the means?—Let us see.

Whatever laws exist on school punishments, and however unbroken the line of decisions in favor of the teacher's right to punish, within limits, the laws may be abolished and the decisions superseded. The example of Syracuse shows this, and also how hopeful we may be of reform in this and other directions, even long before the body of the people are converted to it. Less than two years had elapsed after the July riots, when caste was suppressed in New York conveyances the day following a judicial decision. The prejudices of citizens remained the same, only the custom was changed; yet the reform was real for the victims of the previous abuse. Bearing this experience in mind, we ought not to despair of getting wholly rid of corporal punishment whenever, in any place, the more enlightened few conspire to that end. And, perhaps, just because it is as easy to overthrow the practice as to regulate and restrain it, we have never undertaken to define the cases in which a teacher may and may not flog his pupils. Yet these fall naturally into two well-defined divisions, in one of which the use of the rod may be an open question, in the other must be condemned as either inhuman or absurd. That is to say: suffer, if you will, that a child be beaten for offences against order, good manners, good morals, positive commands, etc., but save him from like treatment for inattention, imperfect preparation of his studies, faulty recitation, failures to comprehend, and all delinquencies which relate, not to his conduct under government, but to his progress under instruction. If any boy in Mr. Hays's charge is insolent, insubordinate, a mischief-maker, a bully, and Mr. Hays deems it expedient to batter him with a crab-apple limb, be it so;

but let it be forbidden to him or any other teacher to "have a rule that when a scholar misses two words or more" a finger shall be lifted in violence against him.

The emancipation which we advocate is not for the pupil alone. The master will gain even more conspicuously. Grown old in his profession, his present characteristics are rigidity and narrowness. Authority, and the constant exercise of it, have done for his temper what they do for that of every monarch, whether on a throne or on a plantation. The discipline of self-constraint—the highest permitted us—he will have lost in great measure, if not altogether. In accomplishing betimes the everlasting routine, his mind has not had the leisure, and has forgotten the ambition, to enlarge itself with fresh acquisitions, so as to keep the work of the school-room in close and inspiring communication with the intellectual progress of the age. Enthusiasm has long ceased to be, what it should be, the badge of his profession; and not the badge only, the tradition—the *thing handed down* from generation to generation—a thirst for knowledge, along with ravishing glimpses of its boundless domains. Instead of to some such prospect,—its hazy horizon melting into an ever-tempting, ever comforting blue; broad meadows, sun-streaked or dappled with hurrying cloud-shadows; streams running out to a far sea, gleaming between opposing mountain-chains, and, at their feet, spring leaves and blossoms,—he has led his pupils through fenced ways without terminus or outlet, dismissed them at the barrier devoid of longings except for a liberty which they cannot comprehend or fail to abuse, and mistaking the grass in the ruts they have traversed for the whole vegetation of the world into which they are cast. He has been a perhaps ignorant accomplice in a scheme of education which measures intellect as Xerxes counted his army, by solid contents, and which says to the audience, at school exhibitions: "In the graduating class each boy's head has been fitted, by a little judicious pressure, to contain so many cubic yards of arithmetic (labelled Greenleaf), so many of geography (labelled Cornell), so many of spelling (labelled Webster), etc., etc., all as prescribed at the beginning of the term. With this outfit, ladies and gentlemen, the Committee professes itself perfectly satisfied, and cannot but congratulate parents on so faithful and diligent an instructor, etc., etc." Finally, the subject of such a eulogium has been the victim of a system which, by demanding severity of discipline and exactness of performance, makes it almost impossible for the teacher to be, what the true teacher will ever be, an ardent student, or disposed to recognize and adopt improved methods of instruction, or capable of advising parents in the most important and perplexing matter of their lives—to what pursuit they shall best turn their children, and at what point their schooling (not their education) should cease.

STUDYING LATIN.

I.

BOYS were once put to the study of Latin for the simple purpose of learning the language. In old times, Latin was of some worth for its own sake. It was the means of intercourse, not between the learned only, but also between all who belonged to the better classes. It was the language of diplomacy and of the Church. Its literature contained almost all the knowledge that was thought worth knowing. And then, as now, acquaintance with Latin gave insight into the structure and force of English words. There were, therefore, good reasons for studying Latin for its own sake.

Now, however, the advocates of Latin urge a different motive for the study. The motives that once induced to it have in great part ceased to exist. The language is no longer a means of communication; its literature is not so valuable, relatively, as it was in the Middle Ages, and even those who know Latin, gain their acquaintance with its literature for the most part through translations. The language is still, it is true, very useful as a teacher of English; but I do not know that it has any other tangible value in these times.

The ancient reasons failing, others are brought forward. Latin ought to be studied for the sake of the training to be gotten thereby. We want formation rather than information, is the cry; we want education, not cram. Now it certainly looks suspicious when new reasons have to be contrived for old customs; yet it can hardly be denied that the study of Latin is a good training-process. It is admitted that it cultivates the memory and refines the taste; gives keenness to the reasoning powers and accuracy to the judgment; and to faithful students of fair ability, imparts a good training in rhetoric and the art of method.

These, then, are the reasons generally advanced for the study. I think that few will not admit Latin to be worth something when once learned; and fewer still will fail to see its value for training purposes; there are many, however, who in fact hold that these two objects are opposed to each other. Thus the old way of learning Latin—that is, by the systematic study of the grammar—although generally allowed to be an indirect and unsatisfactory way for learning the language, is notwithstanding supposed to be the most effective as a training process.

Yet these two objects are not antagonistic: on the contrary, the method that is best as regards the speed of acquisition of the language, is also the best for training the mind.

Let us consider the methods of study.

Speaking loosely, one may be said to know Latin when he has learned three things :—

I. The Inflections.

II. The Constructions.

III. The Words.

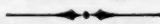
If one knows the various forms taken by nouns, adjectives, pronouns, verbs, and adverbs, and the uses of those forms ; if he understands the laws which must rule in forming sentences ; and if, in addition, he knows the meanings of all the common words of the language : he may be said to know the language ; although, of course, he may yet be far from using it with elegance.

These then are the elements of the knowledge of Latin. What is the common method of acquiring these elements ? They are studied separately, and little or no use is made of the knowledge gained until the scholar is far advanced in his course. First the inflections are learned bodily ; then the constructions are learned in the same way ; whilst the words are left to be acquired by daily thumbing the leaves of the dictionary.

The result is, that most boys who study Latin in this way learn but little, and become thoroughly disgusted with the subject ; some, however, learn to do Latin into English with considerable facility, by the aid of the dictionary. Without the dictionary they cannot translate ; they do not know the words.

The other way to learn Latin is, to learn the inflections, the constructions, the words, simultaneously ; and to learn nothing which is not to be put to immediate and constant use.

The result of this method of study is that boys can learn to read, write, and speak Latin, correctly and fluently, at no greater cost in labor than the other method involves for its poor results. When they take up *Cæsar*, instead of reading with painful effort a dozen lines, or at most half a page, they will be able to translate five or six pages at a lesson both well and easily ; and at that stage of their progress they will have learned the commoner inflections, constructions, and words of the language ; and their knowledge having been fastened by actual use, will be such that they cannot forget it ; it will be to them "a possession forever."



ANALOGY OF EDUCATION TO PLANT-GROWTH.

THE mind is not simply a void to be filled, or wareroom to be stored ; pouring in knowledge, or storing away facts, however well done, is not enough.

The mind is not a canvas or tablet for surface-sketching ; memorizing is not enough.

The mind is not well-grown muscle needing only exercise to give it hardness, and training to give it skill : discipline is not enough.

Least of all is the mind, especially the child-mind, whatever be its nature else, a thing of unmistakable instincts, needing no control or guidance, but only impulse to urge it forward : pleasing stimulant will not suffice.

How then shall we view the mind ? Material forms and notions seldom illustrate spiritual ideas well ; yet with due care they may become quite helpful.

In the corn-grain is a mysterious life-germ. Of its real nature we know but little. Drop it in the soil, where are moisture and warmth, and in answer to its inner power it will swell, burst, send down a rootlet for the meat and drink God has placed there for it, and shoot up a leaflet for air and light. Stir the earth about it and it will throw out root after root for a firmer hold, and mouth after mouth to gather to itself the richer stores. Let the winds shake it, and it will add fibre to fibre to resist them. Let the sun dart his beams, and the evening drop her dews upon it, and it will unfold blade after blade to gather them to its bosom, and thus build up and enrich its own life, and finally put out its nodding ensign, bidding man to joy in its beauty, and come and take of its plenty.

Divine wisdom drops a nut in the forest. It, too, under the stimulus of heat and wet, and obedient to the wondrous life-power in it, sends down its root with mouths for food, sends up its branch with lungs for air, adds limb to limb and leaf to leaf to catch the sunlight and rain-drop, adds growth to growth and root to root to stay the tempest, until the little thing you might fillip with your finger swells to the mighty monarch of the forest, lifts its head beneath the weight of centuries, and challenges the king of storms to battle.

Now here are many things to be noted. Let us glance at a few of them.

1. There is in the seed an inherent life-power, a kind of growth-force ; in answer to which, expansion, development, and growth go successively and successfully on.

Just so in the mind. There is in it an inherent life-element, a sort of growth-power, which is the basis of all its activity and development. With this, mainly, education has to deal.

2. In the seed this growth-power is at first latent ; it may become active early, or lie dormant years, and even ages, and yet keep its vitality, only waiting its proper conditions to spring to activity and life.

So in the uneducated mind, whether of the child or full-grown man, there is a nucleus of latent power. It may be called into action early

or late, developed to a might of which we may yet have but a faint conception, or left in its embryonic state while years shall harden the bands that bind and lock it in their close embrace. Yet it is still there—ever there—hidden it may be, and, like the wheat-corn in the mummy's hand, long buried from sight, yet still living on in its prison-house of neglect, and only waiting the magic touch of Education's wand to wake it to energy and a higher life.

3. This growth-power of the seed owes its very first movement, and much that follows, to outside influence, moisture, warmth, etc., without which it must lie dormant or stop short of its end, with which it must become and remain active.

So of the mind. Without contact with the outside world through sight, sound, touch, etc., there cannot start its first spring of life, nor can its growing powers long keep active; with this contact its hidden forces begin to move and ply their busy functions. Education is to promote this contact, and direct this movement.

4. Plant-growth has its food and organs of supply. Its food, found in the soil and air around, is taken up by its feeders and distributed to uses as the inner plant-life demands. It is in no case crowded into the plant. True, the organs of supply may be quickened to a higher action, and an undue measure of food may be taken in, but not without derangement to other functions, and hence a stoppage rather than an increase of healthy growth.

So mind has its food in the world around and its feeders in the organs of sense. These latter—eye, ear, touch, taste, and smell—in their healthy action, gather up and bear in such and so much knowledge as may be needed for the manifold calls of each stage of the mind's growth. Their undue action must derange and embarrass the whole. Education is to take note of and conform to this law of supply and demand in mind-growth.

5. This life-force of the seed, by which its food is gathered, assimilated, and applied, and thus its growth carried on, is called to many a changing duty, and to each in its own time and season. The swelling germ, bursting shell, rising sprout, unfolding leaf, hardening fibre, encircling bark, gathering bud, opening blossom, growing and ripening fruit, are only results of countless unseen efforts and movements, none of which can be greatly hindered or hurried out of its usual rate or order without hurt, if not ruin to the whole.

So, but much more, with mind. Its growth-power is called to a thousand offices, changeful and mysterious as are the countless forms and degrees of human thought and feeling. These all have their times and seasons: break in upon them largely, and confusion if not havoc must soon follow.

But further, in mind as in plant-growth, all these outside growth agencies as well as the answering inside growth energy, have manifold modifications of nature, degree, time, and circumstance, which make up the whole development and final character of the man. All these it is the province of education to understand and use.

6. Plant-life has lower and higher forms or types. In ratio as the form is lower will the plant withstand rough treatment, mutilation, and even partial destruction. Certain plant forms may be cut or broken to many pieces, and yet each part hold to its life and growth to its full development. As the form of life is higher this is less and less the case, each higher form allowing less tampering, and yet needing more care. Soul-life, the highest form of created being, least of all will bear without hurt the influence of destructive agencies or the harm of unwise tampering.

Further, in ratio as forms of life are higher, they cannot be left to chance influences and yet reach their full development, but are the more dependent on intelligent foresight and care.

Mind or soul, being to us the highest form of growing life, least of all can be left to chance, and most of all needs intelligent guidance and watch-care.

7. Plant-growth has its ideal form : all its powers look to a divinely appointed plant-type. Its every effort is toward this, and its every outside agency should aid it thither. But it meets many a hindering cause—the worm, the fly, the drought, excessive wet, mildew, blight, frost, heat, hail, and storm.

So, mind-growth has an ideal end : all its lively forces look to a divine and perfect man-type. Its every outward agency and every responsive inward effort should point thither. This perfect man-type is no less than an image of the very God. But there are a thousand hindering causes that, in this case, have well-nigh gained the mastery. Education must be ready to lend a hand to every favoring influence, check and beat back every opposing agency, and thus build up the Perfect Man. Because it does not do this, or does it so badly, humanity is so sadly far from its archetype.

8. Once more, but now very differently. Plant-life, having its typical form finite, soon arrives at its end and passes away. Soul-life, having its typical form infinite, even God, admits an endless growth.

Again, in the healthy plant decay sets not in until growth is complete. This being true of the healthy soul, and its growth admitting of no completion, how bright becomes the vision of an endless and ever-advancing life !—a view which ten thousandfold heightens the hazard of faults and blunders, and enhances the glory of success IN EDUCATION.

VOWELS BEFORE R.

THE vowel-sounds in English, viewed with reference to their uniting in utterance with a succeeding *r* sound in the same syllable, may be classed as (1) those that do, and (2) those that do not, unite with it. The former class includes all the short vowel sounds (as in *marry*, *merry*, etc.), and three of the long ones; namely, *a* in *far*, *a* in *war*, and *e* in *her*.¹ The latter class includes the remaining long vowel-sounds and all the diphthongal sounds properly so called; as,

1. *a* alphabetic, as in *fale*.
2. *e* alphabetic, as in *me*.
3. *o* alphabetic, as in *no*.
4. *a* as in *ask*, *pass*, *branch*, as noted by Worcester.
5. *o* as in *move*=*oo* in *noon*=*ou* in *soup*=*u* in *truth*.
6. *ai* (= *a* alphabetic + *i* in *pin*) as in *aye*, meaning "always."
7. *ai* (= *a* in *far* + *i* in *pin*) as in *ay*, meaning "yes," and in *aye-aye*, the name of a sort of monkey.
8. *oi* (= *o* in *on* + *i* in *pin*) as in *voice*, *joy*, etc.
9. *i* long (= *a* in *era* + *i* in *pin*) as in *pine*, *my*, *eye*, etc.
10. *ow* (= *a* in *era* + *u* in *full*) as in *how*, *sound*, etc.

Three of these sounds (6th, 7th, and 8th) are never in English followed by *r* in the same syllable. They are, therefore, never found in such a position as to render it possible for them to unite with a succeeding *r* in utterance.

The sound of alphabetic *a*, comparatively speaking, is very rarely followed by *r* in the same syllable; and then, perhaps, in what some may consider questionable cases; as in *mayor*, *e'er*, *ne'er*, *layer*, *payer*, *gain-sayer*, and several other words in *-ayer*. *Mayor*, with *ay* sounded as in *may*, most authorities mark as a dissyllable. Sheridan and Knowles make it a monosyllable; and so do the poets generally. As to *e'er*, the earlier lexicographers are without it. Worcester and Porter² make it a monosyllable, but make it rhyme with *fare*. *Ne'er* is marked to rhyme with *layer* by Sheridan, Perry, Walker, Knowles, Webster, Smart, and Reid. Worcester and Porter make it rhyme with *fare*. The etymology of the word is certainly in favor of the former pronunciation. For as *e'en* is simply *even* with the *v* dropped out, so *ne'er* is *never* without the *v*. The first *e*, not being able to retain its short sound, passes naturally to its corresponding

¹ This last, some would call short. But whether long or short, it unites freely with the sound of *r*,—none more so.

² By "Porter" is meant the Unabridged Illustrated Webster, in distinction from Webster's own Dictionary.

long one, the *a* in *knave*; just as the *a* in *can* passes into its corresponding long sound (the *a* in *grass*, *branch*, etc.) in the contracted form *can't*. The same may be said of *é'er*. The two ought, we think, to be pronounced to rhyme with *mayor*, *payer*, etc., not with *mare*, *pear*, etc. As to *layer*, *payer*, *player*, *sayer*, etc., though the authorities are pretty generally agreed in marking them as dissyllables, they are as truly monosyllables as *prayer* (supplication) and *mayor*; as in the following lines:

"Call forth | your sooth | *sayer*. As | I slept, | methought," etc.

Cymbeline, Act V., Sc. 5.

"Became | a brick | *layer* when | he came | to age."

2d *Hen. VI.*, Act IV., Sc. 2.

"To Ba | bel's brick | *layers*, sure | the tower | had stood."

Donne's Satires.

Compare

"My lord, | the *mayor* | of Lon | don comes | to greet | you."

Richard III., Act III.

"He is; | and see, | he brings | the *mayor* | along."—Do.

Now, though alphabetic *a* is, or may be considered as being, in the same syllable with *r* in the above and in similar cases, it does not, in utterance, unite with the *r*. If it did, we should have such a combination of sounds as is obtained in pronouncing the first two elementary sounds of the expression "*a r* | od." Thus *mayor* would be "*may run*" without the sound of *un*; *é'er* would be "*a rod*" without the sound of *od*,—*may r*—, *a r*—.

The remaining sounds of the foregoing table are followed more or less frequently by *r* in the same syllable, as *ear*, *oar*, *air*, *your*, *ire*, *our*. But no one of them coalesces with or impinges upon the sound of *r*. Of this any one may be convinced by taking each of these sounds and pronouncing it and the sound of *r* in succession, slowly at first, afterward gradually bringing them nearer and nearer together. Take *e* for example, and *r*. If the sounds of *only these letters* are given in close succession, one will obtain, not the sound of the word *ear*, but the first two elementary sounds of the word *era*, as though he were going to pronounce that word but stopped short on reaching the sound of *a*,—*er*. If this were the true pronunciation of *ear*, of course there would be a coalescence or union of the sound of *e* with that of *r*, as Worcester represents it to be. But it is evident that the sound of *e* here does not immediately precede and impinge upon that of *r*. A careful analysis of the elementary sounds of *oar*, *air*, *your*, etc., will show the same thing in regard to these words.

"But are not these vowel sounds lengthened or modified?" Not at all. A long sound may be shortened, or a short one lengthened; but that a long sound may be lengthened implies that it is not already a long sound.

One may prolong indefinitely the sound of a long, or even of a short, vowel by dwelling on it. But this is not what is understood by lengthening a vowel-sound; nor is it what is really done in these words. *E*, for example, is no longer in *here* than it is in *he*; nor is *i* in *ire* any longer than alphabetic *i*, or the pronoun *I*. There is no lengthening, then, of the vowel-sounds in these cases. Neither is there any modification of them. If there were, it is evident that the sound of *e* in *hear*, for example, would differ from that in *he*; the sound of *o* in *soar*, from that in *so*. But this is not the case. To test it, take the word *over*. Drop the *v*, and we have *o'er*. We have simply lost one elementary sound, that of *v*. The others remain unchanged and entire. That is to say, long *o* is still long *o*, unmodified and the same in *o'er* as in *over*. Again; take the expressions, "We're here," "Ye're here." The sound of the first *e* in *here* is precisely the same as that of *e* in *we* or *ye*, while that of the remaining letters (*re*) completing the word *here* corresponds to that of the contraction *'re* after *we* and *ye*. The same thing will appear on comparing the sounds of *real* and *rear*. The only noticeable difference is in the sound of the last letter. *You're* and *your*, and other examples, may be compared with like result, all showing that the sound of these vowel symbols (*e*, *o*, *a*, *i*, *ow*) is as truly intact and unchanged before *r* as that of the *r* or other consonants with which they may be connected. The truth is, between these vowel-sounds and the sound of *r* in the same syllable, another sound, that of unaccented *e* in *over*, intervenes and couples the two together. All that can be truly said is, not that these sounds are lengthened or modified, but that they are separated from the sound of *r* by the intervention of this short sound,—the orthoepical link that binds them together. This sound, some call a "glide;" others, "the guttural vibration of the *r*." But it is no part of the *r*. This letter has no "guttural" vibration. All the vibration it ever has, is a lingual one. The consequence is, the true pronunciation of *ear*, for example, is not represented by *ēr*, as Sheridan, Perry, Worcester, and others attempt to represent it; for it consists of more than two sounds. It is properly *e'er*, as that of *oar* is *o'er*, of *air* *a'er*,—three sounds. So *your* is pronounced *yo'er*; *our*, *ow'er*;—four sounds instead of three.

Worcester evidently considered the sound of *a* in *fare* a different sound from that of *a* in *ask*, *grass*, etc. This is implied in his giving to the *a* in *ask* a mark indicating a different sound. But he also says of the *a* in *fare*, it "is the sound of long *a*, qualified by its being followed by *r*." He considers it not a distinct sound from that of alphabetic *a*, in the sense in which *a* in *far*, or *a* in *hall* is, but a sound which long *a* has when followed in the same syllable by *r*, and because it is followed by it, and hence not found in any other connection. But this sound is not, in any sense, the sound of alphabetic *a*. It is as distinct from it as that of *a* in

far, which is a still different sound. It is neither more nor less than what Worcester calls "intermediate *a*," as heard in what Smart would call "the New York pronunciation" of *ask*, or *grass*. This may be seen by carefully comparing *fare* and *fast*, *pare* and *past*, omitting, in each instance, the final sounds of *er* and *st*. Besides, the idea that alphabetic *a* is necessarily qualified or changed because of its being followed by an *r* in the same syllable is shown to be incorrect by our having such words as *mayor*, *layer*, etc., already referred to, in which the sound of long or alphabetic *a* is followed in the same syllable by that of *r* as truly as "intermediate *a*" is in *prayer*. In short, the idea that *a* has the sound that we give to it in *fare* because it is followed by *r*, is purely imaginary. It has the same sound in *ask*, *after*, *can't*, *class*, and a long list of other words. And what is more, while this sound of *a* freely unites in utterance with other consonants, it never immediately precedes that of *r*.

In syllables like *ire*, *fare*, *your*, etc., the short vowel-sound preceding that of *r* necessarily produces something of a dissyllabic effect, though our knowledge of them may forbid our considering them dissyllables. Compare *cere*, *seer*; *dire*, *dier*; *flour*, *flower*; *hire*, *higher*; *gore*, *goer*; *hoar*, *hoer*; *ire*, *eyer*; *lyre*, *liar*; *lore*, *lower* [comp. of low]; *more*, *mower*; *roar*, *rower*; *sire*, *sigher*; *sure*, *shoer*; *your*, *ewer*; *fire*, *fier*(*y*); *wire*, *wier*(*y*); etc. The latter word in each of these pairs, except the last two, is generally marked by lexicographers as a dissyllable. Yet there is no perceptible difference in the ordinary pronunciation of the two words in each; none whatever in the elementary sounds heard. In pronouncing the last word of each set, we may make its dissyllabic character prominent without offence to the ear. In pronouncing the others we cannot. And yet even these are capable of being used, though inelegantly, as dissyllables; as, "O who can hold a *fire* in his hands?"—*Shak*. One can scarcely read this line without making *fire* a dissyllable. Substitute *tree*, or *house*, or *child*, or any other monosyllable not of the class under consideration, and we see the difference at once. Compare the following:

"She persevered in getting *nigher*
Every minute to the *fire*."

Among the older English poets, this use of words of this class was not infrequent; as in these lines of Chaucer's:

"For many a man so hard is of his herte,
He may | not wepe, | although | him so | *re smerte*.
Therefore | in stede | of weep | ing and | *prai-eres*,
Men mote | give sil | ver to | the poure | *fre-res*.
His tippet was ay farsed ful of knives
And pin | nes for | to giv | en *fa* | *yre wives*."

Indeed, Walker speaks of *flour* as having "the same sound as *flower*;"

and yet he notes the pronunciation of the two words differently, marking the former as a monosyllable, and the latter as a dissyllable. Johnson and Sheridan spell both words alike—"flower." The truth is, so far as the elementary *sounds* given in the pronunciation of the foregoing pairs of words are concerned, they are precisely the same; and their pronunciation ought to be represented by the same elements. In proof of this, take *you* and *ewe*. These, of course, are pronounced alike. Now add to each the sound of *er*, and they become respectively *your* and *ever*. The same reasoning applies to all. In each example, the combination of sounds preceding that of the final *er* is the same, and in no way affected by the addition of this sound. *More* is simply a "double comparative" form (*moer*) of the obsolete *mo* or *moe* (corresponding to *lesser*), and etymologically is as truly dissyllabic as *lower*, or *fewer*, or *freer*, but irregularly spelt by having the *e* and *r* transposed, as the *e* and *s* are in *whose*, the present orthography for the old possessive-case form *whoes*, equivalent to what would now be *who's*, if it were written according to the modern form of writing the possessive of nouns. *Fiery* and *wiery* are universally marked as trisyllables, though they are very rarely used as such. Webster says, the latter is better written *wiry*; and this he gives as a word of two syllables, though he notes *wiery* as a trisyllable. Chaucer, Hakluyt, Bishop Hall, Beaumont and Fletcher, and other early writers, wrote *wier* and *wyer* for *wire*, and doubtless pronounced the word just as we do. Whatever difference there may be to the eye, as ordinarily pronounced there is none to the ear.

In the written language, the short *e* or *u* sound immediately preceding that of *r*, is generally represented. This is done in various ways.

1. By the letter *a*; as in bear, beard, board, coarse, ear, gear, hoarse, hoary, oar, soared, toward, etc.
2. By the letter *e*, preceding the *r*; as in beer, bier, brigadier, cashier, fierce, e'er, ne'er, o'er, peer, prayer, etc.

Such words as *bier*, *cashier*, *chevalier*, of French orthography, retain the French sound of the *i*, leaving *e* to represent the short vowel sound heard between the sounds of *i* and *r*, and should be so marked, as Perry marks them. Perry, however, errs in marking the *e* as silent.

3. By the letter *e*, following the *r* and in the same syllable with it; as in bore, borne (= *bo'ern*), core, fires, entirely, Ireland, moreover, pure, there, etc. "Flowre" and "flowres," etc., as Spenser and others formerly wrote them, fall into this list.

The *e* in words like these is not "silent," as is generally supposed. It merely exchanges places with the *r* in pronunciation, just as in *acre*,¹

¹ This shows that Webster's change from *centre* to *center*, if consistently carried out, would require us to change *here* to *heer*, *care* to *caer*, *fire* to *fier*, *ore* to *oer*, etc. The sound of *re* in these and similar words is precisely the same as in *centre*, *theatre*, *manœuvre*, etc.

lucre, *centre*, and other words of similar ending. In both cases its omission in utterance would produce the same effect—an imperfect pronunciation of the word. It may be remarked, in passing, that this is the most frequent mode of representing this short intermediate sound.

4. By the letter *i*; as in *air*, *bairn*, *fair-haired*, *their*, *weir*, *weird*, etc.

5. By the letter *o*; as in *boor* (the first *o* here having the sound of *oo* or of *o* in *move*), *boorish*, *door*, *floor*, *iron* (= *ire* + the sound of *n* [which gives the Anglo-Saxon spelling *iren*] = *iern*, as much a monosyllable to the ear as *borne*), *mayor*, *moor*, *poor*, etc.

6. By the letter *u*; as in *bourn*, *course*, *fourth*, *giaour* (= *jow'er*), *gourd*, *monsieur*, *pour*, etc.

There is also quite a long list of words in which this sound is unrepresented. These may be thrown into the following classes.

1. Words in which the *r* is preceded immediately in the same syllable by long *o* and followed by one or more consonants; as, *corps*, *force* (the *e* here merely serving to make the preceding *c* soft), *forcible*, *ford*, *forge*, *fort*, *forth*, *porch*, *shorn*, *worn*, etc.

2. Derivatives from primitives belonging to class (3) above, which, while retaining the *r* in the same syllable with the long vowel that precedes it, lose the final *e* of the primitive, according to the general rule that "words ending in *e* silent [or, rather, '*e* silent or transposed'] drop the *e* on receiving a termination that begins with a vowel;" as, *admirer*, *admiring*, *assurance*, *curable*, *deplorer*, *gory*,¹ *inquiring*, *purser*, *storage*, *wherever*, etc.

Irish, as well as its derivatives, cannot be included in this class. It is not derived from Ireland, but from the Anglo-Saxon *yrisc*, a derivative in A.-S. from *Yr* or *Ir*, the original name of the island, whence the modern *Eri* or *Erin*, the Eng. *Ireland*, the Greek *Ἰέπρη*, *Ἰουεπρία* = *ἸΕεπρία*, whence the Latin *Hibernia*. Like *English* (Lat. *Angles*), *Irish* is properly primitive in our language. There is great propriety, therefore, in the caution given by the author of "Five Hundred Mistakes Corrected" (p. 47),—"Beware of saying *Ierishman* for *Irishman*, or *Ierish* for *Irish*; a very common mistake."

3. Words in which the *r* is preceded in the same syllable by *ou* having

¹ One of our earliest recollections in regard to sound, is the feeling of a want of perfectness of rhyme between *gory* and *glory* in the following lines:

"Slowly and sadly we laid him down,
From the field of his fame fresh and *gory* (*gore-y*);
We carved not a line, and we raised not a stone,
But we left him alone with his *glory* (*glo-ry*)."

We presume others have had the same feeling. We knew not, in our school-boy days, *why* the rhyme should seem imperfect. But, in the light of after investigations, the reason became apparent.

the sound of either *ow* or *oo*; as, devour (pronounced *de-vow'er*), devourer (pr. *de-vow'er-er*), flour, our, scour, soured, souring, etc.; amour (pr. *a-moo'er*), Bourbon, contour, tourmaline, your, etc.¹

4. A few words like *landwehr*, *louis-d'or*, *souvenir*, of foreign, mostly French, nativity and not fairly naturalized as yet in the English language.

5. The anomalous words *choir*, *scarce* and its derivatives, *parent*, and *apparent*.—*Choir* (= *kwi'er*; *oi* = *wi*) we conceive to be without the representative of this short sound, from having dropped the *u* of its original, *Fr. chœur*; and *scarce*, from having dropped one of the *a*'s of its original, *Dut. schaarsch*. As for *parent* and *apparent*, they do not analogically belong to this class, not being derived from any such roots as *pare* and *appare*. Nor are they universally regarded as belonging to this class. Indeed, most lexicographers mark both these words with the alphabetic sound of *a*, which, analogically, is the sound that should be given to *a* in these words.

In conclusion, these sounds (*a'er*, *e'er*, etc.) which, so far as the vowel part of it is concerned, may perhaps with propriety be called diphthongal or triphthongal, belong naturally to final syllables. If we except a few words in classes (1) and (3) last mentioned, they do not properly occur elsewhere in words that are primitive to the language, or words not legitimately, and properly speaking, derived from some other English word. To this remark we make no exception in favor of *Aaron*, *prairie*, or *weary* (Ang.-Sax. *werig*), in each of which the *r* belongs properly to the second syllable, not to the first. *Aery* is simply an irregular if not improper graph for *airy* (*air*). And as for *fiery* and *wiery*, they evidently grew out of, and point back to, the old forms *fier* and *wier*, just as *briery* points to the current form *brier* as its original. Hence we conclude that, when any one of these sounds is found elsewhere than in the last syllable, it should be in words derived from some other English word, in whose final syllable that sound is found, and from which it passes of right to the derivative, provided the vowel before the *r* remains long. But to insert, in a derivative, the sound of short *e* or *u*, when it is not heard in the primitive, or to insert it in a primitive word in which it does not belong,—as, for example, to say *ed-i-to'er-i-al-ly* for *ed-i-to'-ri-al-ly*, or *se'er-i-ous* for *se'-ri-ous*, is really no better than saying *camel-leopard* for *camelopard*, *drowned* for *drowned*, *sawr* for *saw*, *keow* for *cow*, or *tremendyous* for *tremendous*.

We close with giving the following lists of certain words which, from an ignorance or a non-observance of the foregoing principles, are frequently mispronounced.

1. Words in which a diphthongal sound should *not* be heard before the *r*.

¹ In these last, if the *o* alone could be considered as having the sound of *o* in *lose*, *move*, etc., the sound between that and the *r* might be regarded as represented by the *u*. But this, on etymological grounds, seems liable to objection.

Porous, puritan, security, Mary, Flora, query, serious, diphtheria, ulterior, rarity (this should rhyme with *charity*), precarious, memorial, grammarian, siderial, chorus, vicegerent, glory, glorious, story, weary, prairie, furious, spiral, etc. (Say *po-rous*, *pu-ri-lan*, etc. ; not *pore-rus*, *pure-ri-lan*, etc.)

2. Words in which a diphthongal or triphthongal vowel-sound should be heard before the *r*. Gory, aspirant, aspiring, inquiry, desirous, storage, adorer, adorable, during, explorer, inquirer, inquirable, desirable, purer, inquiringly, devourer, scouring, etc. (Say *gore-ry*, *inquire-ry*, etc. ; not *go-ry*, *inquir-ry*, etc.)

PRIMARY EDUCATION.

IN the education of children, no mistake is more common or more injurious than the attempt to hold their minds upon subjects beyond their comprehension. It is common, because many teachers have never learned that there is an order in which the powers of the mind are naturally developed ; or knowing this, have never studied the adaptation of particular subjects to different stages of development. It is injurious, because the mind of the child is dulled, and discouraged by repeated failure to do the impossible things required of it. To a mature mind, principles which appeal to the reason may be just as simple as facts which appeal to the senses ; but to a child who has not learned to reason, they are quite incomprehensible. In nothing is a more skilful use of sound judgment needed than in deciding just what kind of truths are appropriate to each stage of a pupil's education.

It will be found that each of the main departments of study—language, mathematics, and natural science will furnish material aid for each step in the mind's development.

For the earlier school-course, language gives its elements—the alphabet and reading. It may be doubted whether in any period of his life, the child receives a better or more rapid discipline than while learning to read. The influence of the mystic “twenty-six” is supreme. They call for no exercise of reason ; they ask no trial of the judgment : they are so many differently-shaped *facts*, by whose simple permutation other facts more mysterious still are made, and to acquire skill in the use of them, demands only the exercise of patient and careful observation—the very powers, whose cultivation is most needed.

But in his early course, the child can do much more than learn to read. He may at the same time gain clear notions of the elementary facts of mathematics : weights and measures, rightly employed, are proper objects for the cultivation of the senses.

The natural sciences, too, furnish abundant material for the primary course. There are beautiful shades of color to please the eye while it tries to define them ; there are musical sounds to delight the ear while it tries to distinguish their tones : while the most familiar objects are ever ready to open their treasures of mysterious but simple properties to the observation of the little child whose mind is guided by a skilful teacher.

For the higher courses—the training of the understanding and the reason—language furnishes grammar and analysis ; in mathematics, there is arithmetic to be followed by higher branches, wherein abstract reasoning and generalization are required ; in natural science are the elements of natural philosophy and chemistry, to be followed by advanced courses in which the truths of these sciences are subjected to rigid demonstration ; and besides these, are history and philosophy.

Now, since the same subjects are to be continued through all parts of the pupil's course, it must be, that, without sound judgment, the teacher will often make the fatal mistake of presenting truths in the earlier, which ought only to be used in the later periods.

But of what avail is the most correct theory of mental training, even when abundant material is added to it to carry it out, except the teacher knows how to apply it? The question, then, is this : What practical methods of instruction shall be used in these different grades, so as in the end to secure the most complete intellectual culture? This question places us within the sacred precincts of the school-room. It brings us face to face with the immortal minds there gathered, to the point where a mistake may be as fatal as the false thrust of a surgeon's lancet.

First, in regard to the *primary course*. Remembering that the great object is to educate the pupil to habits of quick and accurate observation, and that the means at our command are the *elements* of the various branches of study, the inference is, that these elements must be presented as *facts* which the pupil may *observe*. He is not to recite the arbitrary sayings of a teacher, nor yet to be left to his own resources to learn for himself. He is to be skilfully guided toward inferences of his own. His ideas of color are to be formed through the agency of his own eyes : his judgments of distances and weights are to be settled by experiments made by himself. Object-teaching is founded upon correct principles. Its abuses are not to be defended ; indeed, as often practised, it is little more than a pastime. If, however, the system be bent toward the acquisition of available knowledge in the various subjects of study which the pupil is afterward to pursue, its practice may be as correct as the principle upon which it is based. That it may be so, the teaching should consist of exercises upon the elementary facts and principles of mathematics and natural science ; and conversely, it may be said that the elementary ideas in these departments can be accurately gained only by such a system. For example : a teacher tells the

child that "3 feet make 1 yard;" the child recites: "3 feet make 1 yard," knowing no more of what a yard is than before, because he has no clear idea of the foot which measures it. Nor does it help the matter to tell him that a foot is 12 inches. But suppose you put an accurate foot measure into his hand. He sees it, his eye defines its length; his mind grasps the idea of it, and will retain it after the object is removed. Give him the yard-stick, and his former experience will help him quickly to gain a definite idea of its length, and then how slight the impulse to be given by the teacher to send him forward to the conclusion that "3 feet make a yard!" If it be said that a child when older will, with less trouble, learn these things from books, let us ask if in the mean time he will gain those clear conceptions of what these denominations are, which alone can make them a valuable acquisition? Where does he learn their accurate values? If at all, it must be by accidental jostling against events and things containing them. The same is true of the fundamental facts of science, colors, sounds, motions, etc. Space would fail me to enumerate the subjects which may be used, not simply to amuse, but to discipline, and that, too, with direct reference to future study. Moreover, just in proportion to the accuracy of the child's conceptions of these things, will be the man's appreciation of the almost divine beauty of nature about him, and his ability to engage intelligently in the study of the sciences which deal with it.

Lessons

EASY EXPERIMENTS IN ELEMENTARY CHEMISTRY.

I.

THE inquiry is frequently made for suggestions and materials where-
to illustrate the leading facts of Chemistry.

The demand comes moreover from instructors, whose schools do not pursue this branch of science, but in which it is found desirable for obvious reasons to enliven the regular routine of duties by an occasional scientific lecture.

In preparing the following series of experiments, it has been the aim of the writer to adapt the instruction to the wants of those who have had little or no experience in scientific illustration, and who possess but few facilities for it.

It is assumed in this series of experiments, that the operator has at hand such materials, including simple apparatus, as is usually put up in sets for an ordinary common-school course of chemistry; and, moreover, that he

but if these are not obtained

teacher is supposed to get

few *such materials, including simple apparatus, as is usually put up in sets for a small*

he has at command ^{only the many} such other chemical resources as may be obtained in any country village. *A*

For convenience, the entire list of necessary articles is given below, *Some of them can be made by the teacher.*

APPARATUS.

Alcohol Lamp.	Glass Tubing.
Funnel.	Rubber Tubing.
Mortar.	Evaporating Dish.
Test Tubes.	Retort Stand.
Flasks.	Filter Paper.
Retort.	Pneumatic Trough.

For some of the above, substitutes may be found at hand. Thus a tub, or a pail, or a fish-globe ^{can be made by the teacher} may take the place of the Pneumatic trough. Pipe-stems may serve in place of glass tubes; and sweet-oil flasks are excellent substitutes for the chemical flasks and retorts. For a mortar, strong paper folded over the substance may be used. *The following chemicals will be needed, my drug store will have them*

CHEMICALS.

Chlorate of Potash.	Sulphuric Acid.
Sulphate of Iron.	Nitric Acid.
Sulphate of Copper	Muriatic Acid.
Sulphate of Soda.	Ammonia.
Nitrate of Potash.	Potash.
Nitrate of Baryta.	Nut-galls.
Nitrate of Strontia.	Phosphorus.
Nitrate of Silver.	Iodine.
Carbonate of Ammonia.	Sulphur.
Chloride of Lime.	Alum.
Chloride of Ammonium.	Oxide of Manganese.
Chloride of Cobalt.	Potassium.
Chloride of Mercury.	Sodium.
Yellow Prussiate of Potash.	Bismuth.
Red Prussiate of Potash.	Antimony.
Iodide of Potassium.	Magnesium.
Cyanide of Potassium.	Copper.
Acetate of Lead.	Zinc.
Tartrate of Antimony.	Iron.
Bi-chromate of Potash.	Wax.
Arsenious Acid.	Fluor Spar.
Oxalic Acid.	Litmus Paper.

To make these experiments of service to those who enjoy more extended facilities, the simple series of experiments will be occasionally supplemented by more difficult ones, and distinguished by smaller type.

These should be kept in a box and neatly labeled.

SECTION I.

Explain cohesion as it is
In the study of Chemistry we are constantly led to observe the action of one force, not comprehended in the study of Natural Philosophy. It is the force which binds unlike atoms together to form compounds. We call it Chemical Affinity.

Chemical experiments exhibit the phenomena resulting from the varied operations of this force when the conditions under which it acts, or the atoms between which it is exerted, are changed.

(The force which tends to bind the atoms or molecules (whether simple or compound) of the same body together, is called cohesion. The force which opposes it in all bodies, is Heat.)

Those bodies in which cohesion largely overbalances Heat are said to be *solid*. When the two forces are nearly balanced the body is a *liquid*. If Heat be in excess, the substance is either a *vapor* or a *gas*.

The consideration of these two forces belongs to Natural Philosophy, but inasmuch as we are often compelled to change the *state* of a body to accomplish a chemical change, the study of some of the phenomena of these forces affords an appropriate starting point for Experimental Chemistry.

The various modes in which cohesion acts, ^{cause} lead undoubtedly to the properties we call Flexibility, Elasticity, Pliability, Brittleness, Hardness, etc. These may be exhibited in a piece of steel.

Evms
Exp. 1. Procure a piece of a main-spring of a watch. The nearest watchmaker will give it to you. *has them.*

Show its *flexibility* by winding it about your finger. Let it recover its previous shape to show its *elasticity*.

Heat one end to the distance of an inch to a bright red-heat, and let it cool slowly. The portion heated red-hot will be no longer elastic, but when bent or twisted in any direction, remains so. It is now *pliable*.

Exp. 2. For the second experiment, the spring must be heated as before. First, however, provide a tumbler of water and place it near the lamp in which you are to heat your spring. If you have no Bunsen Gas-burner, you will require an alcohol lamp. Hold the end of the spring in the upper part of the flame until it is at a bright red-heat, and then dip it very suddenly in the water. *It will break.*

If the spring was hot enough and your hand quick enough in cooling it, you will find now that the end experimented upon possesses neither flexibility nor elasticity in any sensible degree. Any attempt to bend it will break it, thus exhibiting its *brittleness*.

Exp. 3. Its *hardness* is shown by its property of scratching glass. To exhibit it, take hold of the broken portion very close to the end; bear it firmly against a piece of glass, and draw it slowly along. It will make a distinct scratch.

This exhibits its hardness

Exp. 3. The *divisibility* of matter and the extreme smallness of an atom may be illustrated by a solution containing iron. Fill, with clear water, a jar capable of holding two quarts.

Dissolve a piece of sulphate of iron about as large as a common white bean, and add the solution to the water in the jar.

Dissolve a piece of red prussiate of potash, about as large as a pea, in a tablespoonful of water.

Add this last solution to the contents of the jar. Stir the whole for a moment. Observe that the liquid is distinctly blue. The quantity of iron added is less than $\frac{1}{8000}$ part of an ounce, and yet a single drop of this solution, if put upon white paper, exhibits the blue color, which is due only to the presence of iron. Much less than the fifty millionth part of an ounce of iron is contained in each drop.

Exp. 4. You may vary experiment (3) with good effect by making your own sulphate of iron. In any porcelain or stoneware cup put a single drop of sulphuric acid and two or three drops of water. To this add a common carpet tack. An effervescence will ensue, which may continue for a minute or two; after which, pour in more water, an ounce or more,—take out the tack, which will be partially dissolved, and add the solution to the jar of water as in *Exp. 3.*

The effect of these two experiments is enhanced if two equal jars of water are provided, and the iron solution is added to one only while the prussiate of potash is added to both jars. The water that contains no iron will not change its color.

Exp. 5. Prepare a jar of water, as in No. 3. Add to it a solution of sulphate of copper, made by dissolving a crystal of blue vitriol about as large as a pea. Dissolve about the same quantity of yellow prussiate of potash in a small quantity of water, and add to the jar containing the copper solution. A reddish brown color is the immediate result.

Exp. 7. Put a teaspoonful of sugar in a tumbler of water. It will dissolve with boiling.

SECTION 2.—Solution and Precipitation.

The solution of a solid in a liquid is the perfect union of the two bodies, producing a compound liquid, containing the solid as well as the original liquid.

We pronounce the solid dissolved when its particles are no longer visible.

The original liquid is called the solvent. Water is a familiar solvent for sugar; but, as every one knows, there is a limit to the amount of sugar that can be made to disappear in a given amount of water. When this limit is reached, the solution is said to be saturated.

Among the different solids with which we experiment, the extent to which they are severally soluble is very different. Thus water will dissolve

more than one-third of its own weight of common salt, but only one five-hundredth of its weight of sulphate of lime.

Solubility generally varies with the temperature of the solvent, being generally greater for the ^{higher} temperatures. More sugar will dissolve in hot than in cold water.)

(Salt is an exception to the general rule, and is equally soluble in hot and cold water.)

(It is an interesting fact that a saturated solution of sugar will dissolve a little salt.)

When a chemical change accompanies the process of dissolving, the result is a "*Chemical solution*." An illustration is afforded when iron is dissolved in sulphuric acid, ^{Exp. 5.}

In *simple solutions*, like those just mentioned, the solid may be recovered in its original state by evaporating the liquid.)

In chemical solutions, on the contrary, the solid obtained in like manner is a new compound body. In the sulphuric acid and iron solution, the solid left after evaporation is sulphate of iron.

8 *Exp. 6.* Heat a small quantity of water up to the boiling point (the experiment is best shown in a flask); add gradually as much sugar as the water will dissolve. It is now a saturated solution. Let it cool slowly, and the sugar will begin to appear at the bottom of the vessel. This shows that hot water will hold in solution more sugar than cold water.

9 *Exp. 7.* Procure an alcoholic solution of camphor (called "Spirits of Camphor"); a teaspoonful is enough for the purpose. Observe that it is a clear solution. Empty it into a wine-glass full of clear water. The camphor appears at once as a white pulpy mass.)

(This gum, like many others, is soluble in alcohol but insoluble in water.

10 *Exp. 8.* An easy example of chemical solution is afforded by pouring upon a small scrap of zinc, some dilute sulphuric acid (about eight times as much water as acid). The experiment may be performed in a test tube. The bulk of the piece of zinc may be about one-tenth of the liquid.

After the effervescence has ceased, set it away for some hours. Crystals of sulphate of zinc (white vitriol) will appear.

When solutions of different substances are mixed, if they contain together the constituents of some insoluble compound, the latter will appear in fine particles throughout the liquid. This phenomenon is called *precipitation*, and the accumulated solid particles a *precipitate*. It is sometimes produced by effecting a change in the character of the solvent. Experiment No. 7 affords an illustration of this. ^{precipitation}

Precipitation and solution are both exhibited in the following experiments.

Exp. 9. Dissolve in half a wine-glass of water as much chloride of mercury (corrosive sublimate) as would equal half the bulk of a pea.

Dissolve also in about twice the above quantity of water some crystals of iodide of potassium, whose bulk together shall be about five or six times that of the chloride of mercury.

Add gradually the iodide solution to the other. A precipitate will be formed, at first yellowish, then changing with more or less rapidity to a bright vermilion. This new compound is the iodide of mercury. Continue to add the solution of iodide of potassium, and the red precipitate will be entirely dissolved. The iodide of mercury, which was formed by the union of the iodine from one solution with the mercury of the other, is insoluble in water; but, as this experiment proves, it is soluble in iodide of potassium. The solution, moreover, when complete, shows no trace of the bright color of the precipitate.

This experiment may be varied by using a small portion of the iodide of potassium and a larger quantity of chloride of mercury. Add the chloride solution slowly to the iodide until the red precipitate is produced and redissolved as before.

12 *Exp. 10.* Prepare some lime-water by allowing a piece of common quicklime as large as an egg to stand in a quart of water for a day. A white film will probably be found on the surface. Pour off the clear liquid for use: it will keep indefinitely in a corked bottle.

To a wine-glass full of lime-water add about twice as much water; the whole in a tall glass: a beer-glass is about the right dimensions and shape. Now insert a tube or a pipe-stem nearly to the bottom of the liquid, and blow through it for some time. The lime-water will soon present a milky appearance. This is owing to the presence of carbonic acid gas in the breath, which forms carbonate of lime in the solution. If the process is continued for some time, the water will again become clear. This is owing to the fact that water will hold carbonic acid gas in solution, and the solution is capable of dissolving carbonate of lime.

13 *Exp. 11.* To obtain the result of experiment (10) more rapidly, prepare a bottle with a cork and glass tube bent twice, so as to form a letter U. Insert one branch of the tube in the cork.

In the bottle put some pieces of marble, and water enough to partially or quite cover the pieces.

Add either hydrochloric or sulphuric acid until a brisk effervescence begins, then put in the cork and place the other branch of the tube in the lime-water, prepared as in the last experiment. The result will be accomplished as in *Exp. 10*, but more rapidly.

In this experiment the tube that passes through the cork should not reach the liquid in the bottle.

In the absence of a bent glass tube use a straight one, and conduct the gas through a rubber tube.

The common soda used in cooking, may be substituted for the marble.